

Fort Denison

Conservation Management Plan



© 2019 State of NSW and Office of Environment and Heritage

With the exception of photographs, the State of NSW and Office of Environment and Heritage are pleased to allow this material to be reproduced in whole or in part for educational and non-commercial use, provided the meaning is unchanged and its source, publisher and authorship are acknowledged. Specific permission is required for the reproduction of photographs.

The Office of Environment and Heritage (OEH) has compiled this report in good faith, exercising all due care and attention. No representation is made about the accuracy, completeness or suitability of the information in this publication for any particular purpose. OEH shall not be liable for any damage which may occur to any person or organisation taking action or not on the basis of this publication. Readers should seek appropriate advice when applying the information to their specific needs.

All content in this publication is owned by OEH and is protected by Crown Copyright, unless credited otherwise. It is licensed under the [Creative Commons Attribution 4.0 International \(CC BY 4.0\)](#), subject to the exemptions contained in the licence. The legal code for the licence is available at [Creative Commons](#).

OEH asserts the right to be attributed as author of the original material in the following manner: © State of New South Wales and Office of Environment and Heritage 2019.

Cover image: Pinchgut (Fort Denison), Sydney, before 1885. Image from the collections of the State Library of NSW.

Published by:

Office of Environment and Heritage
59 Goulburn Street, Sydney NSW 2000
PO Box A290, Sydney South NSW 1232
Phone: +61 2 9995 5000 (switchboard)
Phone: 1300 361 967 (environment information and publications requests)
Phone: 1300 361 967 (national parks, general environmental enquiries, and publications requests)
Fax: +61 2 9995 5999
TTY users: phone 133 677, then ask for 131 555
Speak and listen users: phone 1300 555 727, then ask for 131 555
Email: info@environment.nsw.gov.au
Website: www.environment.nsw.gov.au

ISBN 978-1-925753-65-3
OEH 2018/0234
January 2019

Find out more about your environment at:
www.environment.nsw.gov.au

Contents

Executive summary	ix
History	ix
Significance	ix
Summary of conservation policies	x
1 Introduction	1
1.1 Site location and management of Fort Denison	1
1.2 Heritage listings	2
1.3 Purpose of the conservation management plan	2
1.4 Methodology	2
1.5 Sources consulted	3
1.6 Authorship and acknowledgements	3
1.7 Terms and abbreviations	3
2 Historical analysis	5
2.1 Aboriginal use	5
2.2 Early colonial use	6
2.3 Construction of a battery	8
2.4 Construction of Fort Denison	16
2.5 Fort Denison in the 19 th century	22
2.6 Fort Denison in the 20 th century	29
2.7 Fort Denison in the 21 st century	38
2.8 The fort as part of a cultural landscape	39
2.9 Historical phases and themes	40
3 Physical analysis	43
3.1 Description of physical elements	43
3.2 History of alteration to fabric	46
3.3 Archaeology	67
3.4 Condition of elements	81
3.5 Views	82
4 Comparative analysis	85
4.1 Martello towers across the world	85
4.2 Colonial fortifications in Australia	85
4.3 Islands of Sydney Harbour	86
4.4 Places of convict confinement, punishment and labour	86
4.5 Sites associated with Lt-Col George Barney	87
4.6 Early tide gauges in Australia	87
4.7 Time guns	87
4.8 Ordnance	87

5	Heritage significance	88
5.1	Introduction	88
5.2	Assessment of significance against state criteria	88
5.3	Statement of heritage significance	92
5.4	Significant fabric, features and artefacts	93
6	Constraints and opportunities	120
6.1	Constraints flowing from significance	120
6.2	Statutory constraints	120
6.3	Stakeholder interests	124
6.4	Physical condition and environment	124
6.5	Opportunities	124
7	Conservation policies, guidelines and actions	126
7.1	Adopt best-practice conservation procedures	126
7.2	Acknowledge, retain and enhance heritage values	127
7.3	Facilitate ongoing use of the site	128
7.4	Recognise layered history	129
7.5	Manage environmental challenges	130
7.6	Maintain an appropriate setting	132
7.7	Conserve according to significance	133
7.8	Manage moveable heritage	135
7.9	Guide sustainable future development	136
7.10	Resolve operational issues	137
7.11	Comply with heritage legislation	139
7.12	Involve associated people and communities	140
7.13	Provide effective management	141
7.14	Record the place	142
7.15	Tell the story	142
8	Implementation	144
8.1	Short-term implementation (12 months)	144
8.2	Medium-term implementation (1-5 years)	144
	Interim	145
8.3	Cyclical maintenance plan	145
9	Bibliography	151
	Appendices	153
	Appendix 1: State heritage	153
	Appendix 2: Measured Drawings	154
	Appendix 3: Fort Denison moveable heritage collection inventory	156
	Appendix 4: Sandstone Conservation Works 1983–1995	167

List of tables

Table 1	Muzzle-loading guns used in Port Jackson's defences	19
Table 2	Historical phases and themes	41
Table 3	Archaeological potential	80
Table 4	Assessment of significance	94

List of figures

Figure 1	Location plan of Fort Denison	1
Figure 2	Site plan of Fort Denison showing the main features	1
Figure 3	Vincent Woodthorpe's Pinchgut Island, 1803	7
Figure 4	Edward Close's Pinchgut Island, 1819	7
Figure 5	Pinchgut Island, 1840	9
Figure 6	Sketch plan of Pinchgut battery, probably by Henry Lugard, between 1842 and 1844	11
Figure 7	Sydney Harbour from the old fort, circa 1850	11
Figure 8	The keystone of the magazine arch	17
Figure 9	The 10-inch shell gun (left of image) and 32-pounder gun battery on Fort Denison, circa 1859	18
Figure 10	Fort Denison 1879, showing the 32-pounders on dwarf traversing carriages and the 10-inch shell gun en-barbette	19
Figure 11	Fort Denison after completion of the 1859 loophole flank defences and seawall	20
Figure 12	Elevation and inside view of the tower on Mortella Point which inspired the construction of over 100 British Martello towers	22
Figure 13	Recreation of a barrack room at Fort Nelson	24
Figure 14	Results of shot practice, July 1864	26
Figure 15	The oil lantern on top of the tower	27
Figure 16	Fort Denison lightkeeper Thomas Wren and family	28
Figure 17	The 8-inch shell gun with original traversing carriage emplaced in the bastion	30
Figure 18	Fort Denison after 1915, showing the new light, reconstructed Tide Gauge Room and the new wharf	31
Figure 19	The one o'clock gun, still on its original garrison carriage and standing atop remains of an old 32-pounder gun carriage	31
Figure 20	Fort Denison after 1917, showing the boat slip and yard, water tanks and one o'clock gun in the embrasure to the left of image	32
Figure 21	Fort Denison in 1934 during the arrival of the Duke of Gloucester on HMS <i>Sussex</i>	33

Figure 22	Fort Denison, 1948	34
Figure 23	Tide chart showing effect of earthquake, May 1960	35
Figure 24	32-pdr gun carriages, 1964	36
Figure 25	Pre-1992 proposal for a removable canopy for special events	37
Figure 26	The restaurant marquee	38
Figure 27	Fort Denison in 2017	39
Figure 28:	M V Howard, <i>The Clearing Fog</i> , centrefold of booklet <i>Fort Denison, Sydney Harbour</i> , by A B Shaw (Maritime Services Board undated, c1960s)	40
Figure 29	Plan of Fort Denison identifying physical elements	43
Figure 30	Storm damaged marquee (left) and detail of missing chimney demolished by the same storm	47
Figure 31	Installation of new membrane roof showing rebuilt chimney, 1997 (left) and detail of rebuilt chimney for kitchen exhaust, 2000	48
Figure 32	Floor structure in Room B6/B7 after removal of floorboards	48
Figure 33	Underside of floorboards from access hatch in Room B6/B7, showing pit-sawn board below and circular sawn board above	49
Figure 34	Photographs of joinery repairs 1998–99	50
Figure 35	Room B2/B3 looking north (left) showing partition and tiling being removed, and north-east wall (right) after render removal, showing bricked up former doorway	51
Figure 36	Room B2/B3 looking east (left), following the removal of render in 1997, showing the plumbing manifold embedded in the wall (NPWS 1997), and detail of the Board of Ordnance stamp on the plumbing manifold (right)	52
Figure 37	Room B2/B3 looking east, showing newly laid concrete topping and hob	52
Figure 38	Room B2/B3 looking south-east, showing new framing to walls	52
Figure 39	Room B4 looking east, after removal of kitchen sink and cupboards	53
Figure 40	Room B4 looking east, after removal of render	53
Figure 41	Room B4 looking east, showing over-sheeted walls and ceiling with access hatches	54
Figure 42	Room B4 looking north-east, showing kitchen fit-out	54
Figure 43	Room B5 fireplace detail (left), and Room B5 looking east (right), after render removal. Note the timber chimneypiece removed from the fireplace	55
Figure 44	Installation of brass ventilation grilles and balustrades, Room B5	55
Figure 45	The timber partition formerly dividing Rooms B6 and B7	56
Figure 46	Room B6/B7 after removal of render, showing bricked up fireplace	56
Figure 47	Room B9/B10 before conservation, showing timber partition, picture rail and solid fuel stove in front of later fireplace	57

Figure 48	Room B11 after metal conservation, showing high level timber rail	58
Figure 49	Room B14, showing former door to Room B15 (left) and work in progress to remove services (right) from former use as generator room	59
Figure 50	Room B15 (left) before conservation and fitting out, and the former external door to this room converted for an explosives store with a reused iron shutter	59
Figure 51	Looking north-west over the West Room roof, showing the corner flue	61
Figure 52	Photo taken after 1913 showing original landing steps on left and 1901 wharf on right	61
Figure 53	The location of the former landing place viewed from the terrace, marked by changes in the stone base course	62
Figure 54	The terrace looking north-east, showing garden beds indicated in 1923 plan and young palm trees	62
Figure 55	The former marquee on the terrace	63
Figure 56	The defensive ditch in 1962	64
Figure 57	The water tanks in the slip yard removed	65
Figure 58	Plan of Fort Denison showing areas that have undergone archaeological excavation, testing or maritime inspections	68
Figure 59	Aerial view of Fort Denison, taken from the south-west	71
Figure 60	View looking north-east over the south-east face of the battery (from the bastion), showing the wet ditch and breakwater. Sandstone bedrock is visible underlying the parapet at left	72
Figure 61	View north-east along the battery towards the Martello tower, with the barracks to the left	72
Figure 62	View of the bastion looking south, showing the concrete gun mount (installed c.1942) and flagpole	73
Figure 63	View south-west along the battery towards the bastion, with the barracks to the right	73
Figure 64	View south-west along the battery, showing the c.1923 drain installed against the barracks to prevent rising damp in the walls	73
Figure 65	Gun race along the battery terreplein, looking south	74
Figure 66	View to the north-east of the Martello tower, with the barracks to the left	74
Figure 67	Interior of Room TB4, at the lowest (magazine) level of the Martello tower, looking south	74
Figure 68	View of the terrace looking south-west, with the barracks to the left	75
Figure 69	View looking west along the north-west seawall (the terrace), showing damage caused by wave erosion	75
Figure 70	Interior view of barracks Room B4 looking east	76
Figure 71	Interior view of barracks Room B5 looking east	76
Figure 72	Interior view of barracks Room B11, now the museum, looking south	77
Figure 73	Interior view of West Room W1, looking south	77

Figure 74	The 1917 slipway, looking west	77
Figure 75	The 1917 slip yard, looking west, with a modern shelter to the right	78
Figure 76	View of the bastion and the 1917 wall of the slip yard, looking east, with a modern shelter to the left	78
Figure 77	Overlay plan of the study area indicating the levels of archaeological potential	79
Figure 78:	View from Fort Denison to sites of Barney's Inner Harbour Defence scheme (OEH, 2019)	82
Figure 79:	View of the Fort Denison field of fire (SixMaps, 2019)	82
Figure 80:	View to the Observatory (OEH, 2019)	83
Figure 81:	View of the Sydney Opera House and Sydney Harbour Bridge (OEH, 2017)	83
Figure 82:	Internal views (Nearmap, 2019)	84
Figure 83:	Gradings of significance for major elements and spaces on Fort Denison (OEH 2019).	95
Figure 84	Photographs of Fort Denison in 2016	99
Figure 85	Photographs of Fort Denison in 2016	100
Figure 86	Photographs of Fort Denison in 2016	101
Figure 87	Photographs of Fort Denison in 2016–18	103
Figure 88	Photographs of Fort Denison in 2018	107
Figure 89	Photographs of Fort Denison in 2016–18	108
Figure 90	Photographs of Fort Denison in 2016	112
Figure 91	Photographs of Fort Denison in 2016	113
Figure 92	Photographs of Fort Denison in 2016	114
Figure 93	Photographs of Fort Denison in 2016–18	118
Figure 94	Photographs of Fort Denison in 2016	119
Figure 95	Map showing the buffer zone (blue hatching) of the Sydney Opera House World Heritage listing	123
Figure 96:	State Heritage Register listing plan for Fort Denison (Source: OEH)	153

Executive summary

History

Fort Denison was constructed on a prominent rock island in Sydney Harbour, known to the Aboriginal people as Muddawahnyuh. Following European settlement, it was initially used as a place of detention and became known as Pinchgut Island. In the 1830s the island came under consideration as part of a proposed harbour defence installation, and in 1840, under Captain George Barney, work began on levelling the island and creating a terreplein and parapet for a gun battery. It was discontinued in 1843, but after further inquiry work recommenced in the 1850s (again under Barney, by now a Lieutenant-Colonel, and Sir William Denison, Governor) to construct a battery with an associated barracks and Martello tower on Pinchgut Island. The fort was named Fort Denison in 1857 and completed in 1862 with the construction of two flanking rooms to protect the fort on the north-west side. The fort was used for gunnery practice until 1876, and its military role appears to have ceased around that time, apart from a brief period of reoccupation by the army for anti-aircraft gunnery during World War II.

Fort Denison had been part of the navigation system for Sydney Harbour since 1858 (when a navigation light was placed on the tower) and a place for tide measurements since 1865, and these uses were continued under the Sydney Harbour Trust which took over the island in 1903. A lightkeeper had been resident on the island since the 1870s, and the barracks block was progressively adapted for the caretaker's residence during the first decades of the 20th century. In 1905 the island also became the site for the one o'clock gun, fired in conjunction with the descent of the time ball on Sydney Observatory to allow ships to check their chronometers. From 1936 until 1992, the island was under the control of the Maritime Services Board, which organised tours to the island from the 1950s. The National Parks and Wildlife Service then took over the island, which became part of Sydney Harbour National Park. Extensive conservation works were carried out to the island during the 1990s and 2000s.

Significance

Fort Denison is of national significance as an exceptionally fine and intact example of a 19th century defence fortification that is unique within Australia. Located in Sydney Harbour, near the Sydney Opera House and the Sydney Harbour Bridge, Fort Denison is a landmark, a sandstone structure mounted on a carved sandstone platform, surrounded by the waters of one of the finest harbours in the world.

Fort Denison is the only island site entirely covered with a fortification within Sydney Harbour and largely retains the integrity of its completed 1862 form. In an international context, the combination of a Martello tower and associated barracks is unusual and rare. The fort, built entirely of local sandstone, demonstrates the evolution from an island to convict shaped rock battery to a completed fort. The Martello tower on Fort Denison is unique as a European styled coastal fort constructed in Australia. It is of international significance as one of only three towers in the southern hemisphere that survive intact, and forms part of a worldwide group of similarly styled and dated European coastal fort towers built during this period. The tower is also of international significance for the integrity of its original casemated ordnance and sidearms.

Fort Denison is associated with several phases of Australian history. As an impressive natural rock island, it was visited regularly by local Aboriginal people, and was first used by European settlers as a place for incarceration of convicts. The island was then modified for defensive use firstly as a battery and then as a more complete fort. As a fort it demonstrates the administration and politics of the British Empire and the need for defensive structures in the colonies during the 19th century, as well as the Board of Ordnance standards and status delineation of military accommodation in the mid-19th century. From the 1890s the island and fort took on a maritime role, as a tide station and as part of the Sydney Harbour navigation system, uses which continue to this day.

Fort Denison is of state significance as the location of the State's principal tide gauge since the 1870s, when the first gauge was installed at the south-west end of the island, and as an integral part of the Sydney Harbour navigation system from 1858, when the first navigational light was installed. The island was the location for the time gun (part of the system for setting maritime chronometers for longitude measurement) from 1906 to 1942, re-introduced and maintained as a tourist attraction in 1986. The occupation of the island by the Sydney Harbour Trust and its successor the Maritime Services Board was incidental to these activities.

Fort Denison's defensive fortification, erected in 1840–62 is a direct reflection of the concerns of the British settlement in Sydney during the mid-19th century. There is a high potential for archaeological remains associated with both the construction of the fort, and the mid and late 19th century military occupation of the island. The existing built fabric presents a rare example of colonial harbour fortification and is representative of the early character of the colony, specifically the employment of convict labour. The buried archaeological remains are reflective of the military occupation of the island, by artillerists and their families. These archaeological features have the potential, through archaeological analysis, to further our understanding of this phase of the development of Sydney and to contribute to our understanding of early colonial defensive works. Archaeological remains related to the 19th century construction and military use of the island are of state heritage significance.

Fort Denison is of local significance as a tourist attraction, recognised for many years by the people of Sydney as an historic fortification that remains an enduring feature in a changing harbour context. The very nature of its massive sandstone construction, combined with its isolation and comparative inaccessibility, adds to its mystique and its landmark status within Sydney Harbour.

Summary of conservation policies

This conservation management plan for Fort Denison prescribes the following conservation policies and provides guidelines for their implementation:

- acknowledge and retain heritage values
- facilitate ongoing use of the site
- recognise layered history
- manage environmental challenges
- maintain an appropriate setting
- conserve according to significance
- manage moveable artefacts
- guide sustainable future development
- resolve operational issues
- maintain statutory protection
- adopt best-practice conservation procedures
- involve associated people and communities
- provide effective management
- record the place
- tell the story.

1 Introduction

1.1 Site location and management of Fort Denison

Fort Denison is located 500 metres north-east of Mrs Macquarie's Point and north-west of Garden Island, within the waters of Port Jackson (**Figure 1**). The place is close to the Sydney Opera House and the Sydney Harbour Bridge. The site consists of Lot numbers 1 and 2 of DP837196.

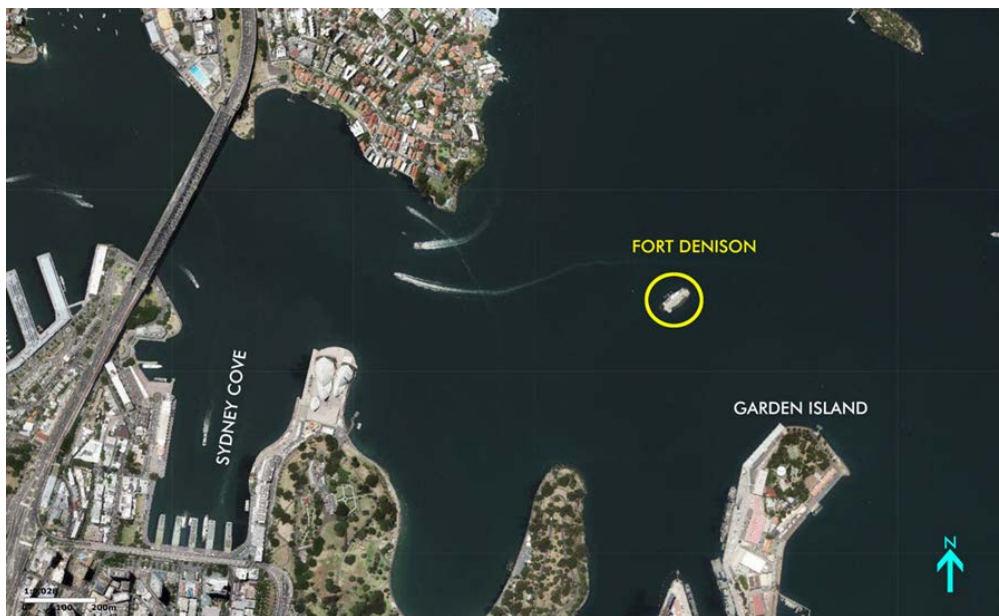


Figure 1 Location plan of Fort Denison (outlined in yellow) (base plan: SIX maps)

The island is aligned approximately north-east to south-west, with the Martello tower at the north-eastern end (**Figure 2**).

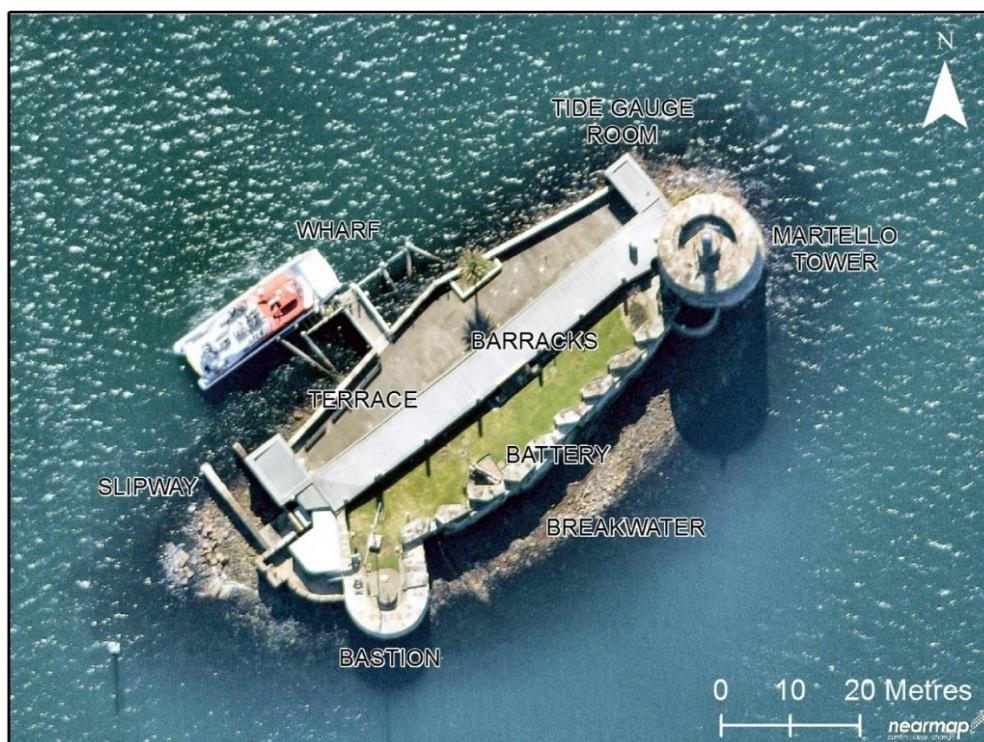


Figure 2 Site plan of Fort Denison showing the main features (base plan: Nearmap)

The NSW National Parks and Wildlife Service (NPWS) acquired management responsibility for Fort Denison in 1992, title in 1994 and incorporated the site into Sydney Harbour National Park (SHNP) in 1995. Fort Denison was managed by the Sydney Harbour Trust from 1901 and the Maritime Services Board of New South Wales (MSB) from 1936 until 1992.

1.2 Heritage listings

1.2.1 Statutory listings

- State Heritage Register, SHR No 00985, gazetted on 2/4/1999. The State Heritage Register plan showing the curtilage of the listing is found in Appendix 1.
- Sydney Regional Environmental Plan (Sydney Harbour catchment) 2005, Schedule 4 Heritage item no. 69.

1.2.2 Non-statutory listings

- Register of the National Estate, place ID 1856, 21/03/1978.
- National Trust of Australia Register, gazetted on 11/02/1974.

1.3 Purpose of the conservation management plan

The purpose of this conservation management plan (CMP) is to establish the heritage significance of Fort Denison, based largely on previous research about the island, and to develop policies and actions specific to NPWS management objectives. These are to ensure the conservation of the heritage significance of the place and its historic fabric, while encouraging public access to experience and learn about the place and its role in the development of Sydney.

During the period that Fort Denison was under the ownership and management of the Maritime Services Board, a detailed conservation report, *Fort Denison* was prepared by Dr James Semple Kerr in 1986. A conservation management plan was subsequently prepared by NPWS in 1999.

The present conservation management plan will be adopted by NPWS as the primary conservation management document for Fort Denison upon endorsement by the Heritage Council of NSW. This document is to be used within the overall management framework for the Sydney Harbour National Park and inform any future revisions or amendments to the Sydney Harbour National Park Plan of Management.

1.4 Methodology

This conservation management plan was prepared by the NSW Office of Environment and Heritage in May 2018, to update and replace the previous conservation plan prepared by NPWS and endorsed by the Heritage Council of NSW in 1999.

This conservation management plan has been prepared in accordance with:

- *The Conservation Plan* 7th edition, James Semple Kerr, 2013
- *Assessing Heritage Significance*, NSW Heritage Office 2001
- *Assessing Historical Importance: A Guide to State Heritage Register Criterion A*, Heritage Office, 2006
- *Assessing Historical Association: A Guide to State Heritage Register Criterion B*, Heritage Office, 2000.

The document *Conservation Management Plan: A Checklist*, Heritage Office, 2003 was used during the review and endorsement process.

1.5 Sources consulted

A range of primary and secondary sources were consulted during preparation of the conservation management plan. The main sources consulted are listed below. Other secondary sources are provided in the bibliography.

Primary sources:

- Newspaper articles
- Government Gazettes
- Journals by David Collins and Watkin Tench
- Sketches, watercolours and photographs
- Measured drawings (appendix 2)

Secondary sources:

- *Fort Denison*, James Semple Kerr, 1986
- *Fort Denison Conservation Plan*, 1999
- *Where Convicts Never Stepped*, June Morris, 1998
- *The Fragile Forts*, Peter Oppenheim, 2005

1.6 Authorship and acknowledgements

Site specialist/historian Robert Newton (OEH) compiled the CMP and prepared the following sections:

- Historical analysis (Section 2)
- Comparative analysis (Section 4)
- Heritage significance (Section 5.1, 5.2 and 5.3).

Heritage architect Peter Phillips (Orwell & Peter Phillips) prepared the following sections:

- Physical analysis (Section 3)
- Significant fabric, features and artefacts (Section 5.4)
- Conservation policies, guidelines and actions (Section 7)
- Implementation. (Section 8)

Archaeologist Tony Lowe (Casey and Lowe Pty Ltd) prepared the archaeological assessment (Section 3.3).

Curator Elizabeth Broomhead (OEH) prepared the moveable heritage inventory (appendix 3).

1.7 Terms and abbreviations

The following terms and abbreviations have been used in this CMP;

AA	Anti-aircraft
Battery	A unit of artillery guns grouped to increase firepower and effectiveness
Carronade	A short muzzle-loading cannon which was lighter than ordinary guns but fired a heavier shot to a range of about 500 metres. A small number were used in fortifications for close defence
Casemate	A vaulted chamber with an embrasure through which a gun can be fired
Citadel	A fort which forms part of the defences of a town and a stronghold for the garrison
CMP	Conservation management plan

Fort Denison Conservation Management Plan

Command	Domination of an area or feature arising from the height of the fortification
CRE	Commanding Royal Engineer
Cwt	Hundred weight (1 cwt = 50.8 kg)
Ditch	An excavation, wet or dry, in front of a rampart
Embrasure	An opening in a parapet, usually widening from within, allowing a gun to fire through
En-barbette	Positioned to fire over a parapet
Fort	A fortified building or strategic position
Fortification	A defensive structure built to strengthen a place against attack
Frigate	A warship with at least 28 guns upon a single continuous deck
Gibbet	An upright post with an arm on which bodies of executed criminals were left hanging as a warning or deterrent to others
Magazine	A store for gunpowder, shells and ammunition
Mount	To place guns in position on a carriage or mounting
MSB	Maritime Services Board of NSW
NPWS	NSW National Parks and Wildlife Service
OEH	NSW Office of Environment and Heritage
Ordnance	Mounted guns
Overtopping	Water carried over the top of a coastal defence (e.g. seawall) due to wave run-up or surge action exceeding the crest height
Parapet	A defence of earth, stone or concrete to conceal and protect troops and guns
Peninsula Wars	The fought in Spain and Portugal during the Napoleonic Wars
Piece	An artillery gun
Pdr	Pounder gun
RA	Royal artillery
RE	Royal engineer
RML	Rifled muzzle-loading
SBML	Smoothbore muzzle-loading
Shell	A hollow projectile containing high explosive designed to detonate with anti-personnel and anti-material effects from blast and fragmentation
Shot	A solid projectile containing no explosive or other filling, intended to overcome hard targets by kinetic energy
SHT	Sydney Harbour Trust (1901–36)
Sloop	A warship with up to 18 guns on a single gun deck
Terreplein	A level space behind a parapet where a battery of guns is mounted
Trunnion	The round axles protruding from the side of the gun which rest in the gun carriage cradle and allow the gun to be elevated or depressed

2 Historical analysis

2.1 Aboriginal use

The island on which Fort Denison was built lies roughly half-way between the inner northern and southern shorelines of Sydney Harbour. The island was about 50 metres wide, 100 metres long and formed of natural sandstone topped with dense vegetation. To the people around the harbour the island was known as Muddawahnyuh, Mat-e-wan-ya or Mattewai.

The Sydney region in 1788 was occupied by over 30 separate groups, or 'clans', of Aboriginal people of the Darug language group, each group made up of around 30–50¹, or possibly up to 100², people related to each other. The north shore of the harbour is the country of the Gamaragal of Cammeray, to the east and west of Balls Head, and the Borogegal from Booragy, today's Bradleys Head. The southern shore west of Darling Harbour is the country of the Wangal, the Cadigal to the east and the Birrabirragal on the eastern-most shore to South Head³. First Fleet marine Watkin Tench reported that these clan names refer only to the men of each place. The suffix 'galeean' or 'galleon' was used when referring to the women of each clan, thus the people residing around the bay called 'Cadi' were the Cadigal and Cadigaleean⁴, and the people residing around Birra Birra, the Sow and Pigs Reef, were the Birrabirragal and Birrabirragalleon.⁵ Aboriginal people of these clans lived in groups known as bands, made up of male members of a clan, their wives, children and unmarried women. Wives married in from different clans, resulting in multi-lingual groups with connections and rights to areas beyond their clan estate.⁶

These coastal clans were saltwater people, with fish and shellfish forming a major part of their diet. They used simple bark canoes or nowies from which to fish. Joseph Banks recorded seeing scores of fishing nowies at night on Botany Bay⁷ and early paintings of Sydney Harbour routinely depicted Aboriginal people in nowies. Men fished with spears in the shallows with multi-pronged fish-gigs, while women alone used hooks and lines, fishing and sometimes cooking in their nowies.⁸

Large numbers of people came together from distant places to feast, celebrate, fight and conduct initiation ceremonies.⁹ The harbour and its islands were a common zone belonging to no one group or person.¹⁰ Water was both a territorial boundary and an avenue for communication travelled for cultural business.¹¹

The smallpox epidemic of 1789 resulted in the death of hundreds of Aboriginal people in a matter of months. According to the Wangal man Woollarawarre Bennelong, the smallpox epidemic was responsible for the death of half of the people who inhabited coastal Sydney and stated that of his Cadigal friend Colebee's tribe (probably his band) there were only three survivors.¹² Despite this catastrophe and the impact it had on social connections and cultural knowledge, the coastal people of Sydney regrouped and made new connections within the expanding colony.

¹ Grace Karskens, *The Colony: A History of Early Sydney*, Allen and Unwin, Crows Nest, 2009, p.37.

² Ian Hoskins, *Sydney Harbour: A history*, University of New South Wales, Sydney, 2009, p.7.

³ Hoskins, p.7.

⁴ Watkin Tench, *A Complete Account of the Settlement at Port Jackson*, 1793, University of Sydney Library, Sydney, 1998, p.134.

⁵ Karskens, p.44.

⁶ Paul Irish, *Hidden in Plain View*, New South Publishing, Sydney, 2017, p. 18.

⁷ Karskens, p. 38.

⁸ Karskens, p.40.

⁹ Karskens, p.42.

¹⁰ Apart from Goat Island, of which Bennelong – a Wangal man – claimed hereditary ownership.

¹¹ Hoskins, p.12.

¹² Irish, pp.20–21.

The only known primary evidence documenting Aboriginal use of the island comes from Deputy Judge Advocate David Collins' *An Account of the English Colony in New South Wales*, Vol.2.

The court having ordered that Francis Morgan should be hung in chains upon the small island which is situated in the middle of the harbour, and named by the natives Mat-te-wan-ye, a gibbet was accordingly erected, and he was hung there, exhibiting an object of much greater terror to the natives, than to the white people, many of whom were more inclined to make a jest of it; but to the natives his appearance was so frightful—his clothes shaking in the wind, and the creaking of his irons, added to their superstitious ideas of ghosts (for these children of ignorance imagined that, like a ghost, this man might have the power of taking hold of them by the throat), all rendering him such an alarming object to them—that they never trusted themselves near him, nor the spot on which he hung; which, until this time, had ever been with them a favourite place of resort.¹³

The term 'resort' suggests that Collins may have been describing a customary or frequent going or gathering¹⁴. As Collins was describing an event which occurred in 1796, it provides evidence that traditional use of the island had until that time survived the ravages of the smallpox epidemic.

2.2 Early colonial use

pinchgut, nautical archaic slang;

1. (noun) someone who does not give other people enough food,
2. (adjective) mean or insufficient, especially in relation to food.¹⁵

On 11 February 1788 three convicts were tried for minor offences. For the crime of taking some biscuit from another convict one prisoner was sentenced to a week's confinement on the small rocky island.¹⁶ Marine Captain Watkin Tench recorded that the prisoner was provisioned with bread and water only.¹⁷ It is very likely this outdoor prison continued to be used as a means of punishing convict misdemeanours. A plan of Port Jackson drawn in October 1788 identifies the island as 'Convicts Island'¹⁸ and between 1796 and 1804 the island became commonly known as Pinchgut Island.¹⁹ The colony's first prison, Sydney Gaol, was not operational until 1797.²⁰

On 30 November 1796 convict Francis Morgan was found guilty of wilful murder, executed and his bodied displayed from a gibbet on the island.²¹ Sailing past Pinchgut Island in January 1800 General Joseph Holt noticed and later described the gibbet and noted the origin of the island's name:

It derived its name from the circumstance of sending here, by way of punishment, some of the most incorrigible on the convicts, where being kept upon exceedingly short allowance, according as their crimes deserved, they conferred upon it the name it bears. The post that appears upon its summit, is the remainder of a gibbet, upon which a cooper, belonging to the colony, was executed for a most atrocious murder....²²

The gibbet was clearly displayed in George Barrington's *An Account of a Voyage to New South Wales*, published in 1803 (**Figure 3**).

¹³ David Collins, *An Account of the English Colony in New South Wales*, Volume 2, Chapter 1, 1802

¹⁴ www.thefreedictionary.com/as+a+last+resort

¹⁵ Collins English Dictionary, 12th edition, 2014

¹⁶ David Collins, *An Account of the English Colony in New South Wales*, Volume 1, 1798.

¹⁷ Watkin Tench, *A Narrative of the Expedition to Botany Bay*, 1788.

¹⁸ *New South Wales PORT JACKSON from the Entrance up to Sydney Cove, taken in Oct.br 1788*, by Port Jackson Painter, Natural History Museum First Fleet artwork collection.

¹⁹ First known printed reference to Pinchgut Island, *Sydney Gazette and New South Wales Advertiser*, 30 December 1804, p.3.

²⁰ https://dictionaryofSydney.org/entry/prisons_to_1920, accessed 8 February 2018.

²¹ Collins, 1802, Chapter 1.

²² Holt, *Memoirs of Joseph Holt, General of the Irish Rebels*, Vol.II, 1838, p.56–7.

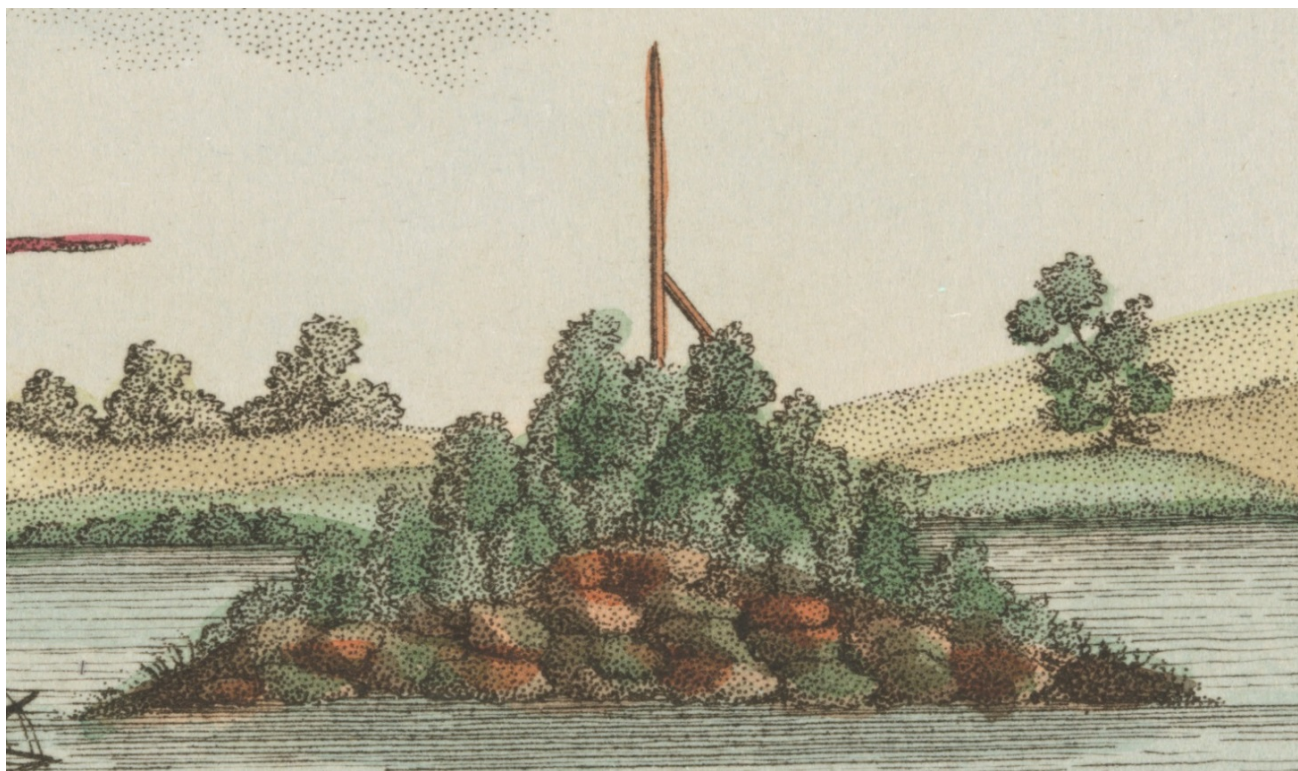


Figure 3 Vincent Woodthorpe's Pinchgut Island, 1803 (National Library of Australia)

Morgan was not the only person to hang from the gibbet. Reformed convict and clerk David Mann, in his 1810 description of the colony wrote:

The small island in the centre is called Pinchgut, which name originated from some persons being placed there on an allowance of provisions for some offence, where they built an oven, the remains of which are yet to be seen. At this time, there is a man named Brown, before spoken of, hung in chains on this spot, for committing several murders.²³

The gibbet had been removed by the time the island was painted by Peninsular War veteran and engineer Lieutenant Edward Charles Close in 1819 (**Figure 4**).



Figure 4 Edward Close's Pinchgut Island, 1819 (National Library of Australia)

²³ David Dickenson Mann, *The Present Picture of New South Wales*, 1811, p.59.

The origin of the name Pinchgut is further supported by a letter to the *Australian* newspaper in 1827 which stated that while there were many reasons given to the evocative name, the best-authenticated owed its origin to the banishment of convicts to the island on short rations.²⁴

Access to Pinchgut Island was otherwise seemingly unrestricted. A hairdresser was found on the island with his throat cut in 1811, a victim of suicide, and as early as 1820 the Governor was authorising boatmen to take paying passengers to the island²⁵, it being a place that parties went to fish.²⁶ Pinchgut Island was also visited by ballastmen who reportedly were spoiling the 'bleak though beautiful little isle' by demolishing the cliffs for stone to use as ballast.²⁷

Pinchgut Island, as well as Balls Head, was proposed as a location for a new Water Police station in 1835²⁸ and the Town Surveyor submitted a plan to the Governor for such a station in 1836²⁹, but the building was ultimately constructed on Goat Island, likely because the newly arrived Royal Engineer Captain George Barney had other ideas for Pinchgut Island.

2.3 Construction of a battery

Since the establishment of the colony in Sydney Cove, the defence of the remote and isolated colony against marauding foreign warships and privateers was of concern, particularly as any news of Britain's entry into foreign wars or cessation of hostilities might take several months to arrive. By 1801 batteries of 4-pounder, 6-pounder and 12-pounder guns had been installed at the Dawes Point Battery (West Battery), Bennalong (sic) Point (East Battery), Windmill Hill and Garden Island. In 1801 a new battery was constructed and armed at the more distant Georges Head to command the entry to the harbour. Maintenance at the battery was evidently not performed, as by 1805 the gun carriages had been made useless by termite attack and were declared unserviceable in 1806.

In January 1804 work began on a citadel on the site of the Windmill Hill Battery, not only to defend the town against foreign ships but also as defence from a land attack. Mutiny and convict rebellion were likely believed to be the potential sources of such an attack and the precaution was not without justification. Six weeks later, an uprising of 300 convicts predominantly from the government farm at Castle Hill was suppressed during the 'Battle of Vinegar Hill'. The citadel was named Fort Phillip, but it was never completed.

Fort Macquarie, built between 1817 and 1821, was designed by colonial architect Francis Greenway at Governor Macquarie's direction to defend Sydney Cove and prevent 'clandestine departures', and no doubt was intended to complement the picturesque landscape and the intended Government House and stables. While under construction William Wentworth described the fort as 'too near the town to protect it from the most insignificant naval force' with embrasures so low that 'a single broadside of grape would sweep off all who had the courage and temerity to defend it.'³⁰ Greenway himself blamed the whole concept and choice of site on Macquarie, after Macquarie had left the colony. Criticism continued a decade after it was completed: 'all military and scientific men have regarded Fort Macquarie as perfectly useless as a fortification...'.³¹ Little real improvement was made to Sydney's utterly inadequate harbour defences over the next 15 years.

Captain George Barney arrived in Sydney with a detachment of Royal Engineers in December 1835 and was placed in charge of convict buildings and various civil works by Governor Bourke. Barney was also asked to report on measures necessary to protect against 'desultory attacks from foreign

²⁴ *The Australian*, 26 October 1827, p.3.

²⁵ *Sydney Gazette and New South Wales Advertiser*, 9 December 1820, p.1

²⁶ *The Monitor*, 23 August 1827, p.7.

²⁷ *Sydney Gazette and New South Wales Advertiser*, 13 September 1831, p.2

²⁸ *Sydney Gazette and New South Wales Advertiser*, 19 September 1835, p.2

²⁹ *Sydney Gazette and New South Wales Advertiser*, 23 January 1836, p.2.

³⁰ Peter Oppenheim, *The Fragile Forts*, 2005.

³¹ James Semple Kerr, *Fort Denison*, 1986, pp.4–7.

cruisers', having earlier described the defences as 'in a very dilapidated state'.³² Barney's recommendations for a series of fortifications to protect the inner harbour were rejected by the Home Government. By August 1838 however the Engineers Department was considering Pinchgut Island as the location for a fortification including a tower³³ which would be the focal point of an inner harbour defence scheme which included batteries at Bradleys Head, Fort Macquarie and Dawes Point.

In November 1839, the unexpected overnight arrival of six ships of the American Discovery Squadron demonstrated the ease by which an armed fleet could enter the harbour and anchor off Sydney Cove undetected. In 1840, without waiting for approval from the Home Government, Governor Gipps approved Barney's plans and assigned 140 convicts to the works. Apart from the removal of stone by ballastmen the island had until that time remained relatively unaltered (**Figure 5**). In July 1840, wooden boxes were being prepared to accommodate the convict iron gang on Pinchgut Island³⁴, though it wasn't until October that this was completed, and the Colonial Secretary's Office placed a notice prohibiting unauthorised access.³⁵ In the same month advice was received that the Board of Ordnance had not approved Barney's requested estimate of £5000 for harbour defences.



Figure 5 Pinchgut Island, 1840 (97/279/1 Collection: Museum of Applied Arts and Sciences. Photo: Sotha Bourn)

Nevertheless, convicts would occupy Pinchgut Island for more than two years. Fresh water was stored in iron tanks and cooking was carried out in a boiler within a weatherboard and shingle kitchen.³⁶

³² 'Barney, George (1792–1862)', *Australian Dictionary of Biography*, National Centre of Biography, Australian National University, <http://adb.anu.edu.au/biography/barney-george-1744/text1931>, published first in hardcopy 1966, accessed online 26 July 2017.

³³ *Sydney Monitor*, 8 August 1838, p.2.

³⁴ *Sydney Herald*, 31 July 1840, p.2.

³⁵ *NSW Government Gazette*, 14 October 1840, p.1026.

³⁶ Kerr 1986, p.10.

Several weeks after commencement of works the convicts were noted as having a 'lazy, lounging attitude'³⁷, though this did not prevent them from trying to escape. On Christmas Day 1840, six prisoners attempted unsuccessfully to overpower the boat crews and effect an escape in the boat and gig³⁸, and in January 1841 another six prisoners successfully escaped from the island, four of whom were apprehended in Liverpool several days later³⁹. Of the remaining two, one was captured near Launceston after being recognised by a constable who had also spent time on Pinchgut Island.⁴⁰

In the first few months into the work the convicts found a skeleton buried between two rocks, covered with a thin coating of earth, which was subsequently inspected by a surgeon. It was found to have marks of slugs in the skull and thought to have been there for some years.⁴¹ 'Old timers' thought it possible it was the remains of Francis Morgan.⁴²

Pinchgut became a convenient location for the punishment of convict misdemeanours. The youngest of four assigned convicts who had been recaptured after absconding from Grose Farm was ordered to complete his 14-day sentence on Pinchgut Island after he stated his intention of 'bolting' at the first opportunity⁴³; convict William Sutton was convicted of assault and sentenced to receive 50 lashes and to be worked in irons on Pinchgut Island for six months,⁴⁴ and another convict was sentenced to 12 months on Pinchgut Island for being absent without a pass.⁴⁵ Barney considered the conditions on the island to be 'much more dreaded...than either the treadmill or solitary confinement' and in March 1842 the Water Police reported that the convicts were so destitute of clothing as to be indecent.⁴⁶ Although the conditions may have been harsh, the convicts' spiritual needs were attended to by the Reverend James Edmondstone who provided a weekly service on the island.⁴⁷

The security of the island stockade was exposed in 1842 when two convicts were charged with stealing livery coats and other items from Sir Thomas Mitchell's stable. Only then was it discovered they had been absent from Pinchgut for nearly a week and their absence was unreported.⁴⁸

Under Barney's supervision the convicts transformed the island into a terreplein battery around 27 feet, four inches wide, with a 15-foot-wide parapet of bedrock (**Figure 6**). In May 1842 Barney advised Frederick Mulcaster, the Inspector General of Fortifications, that Pinchgut was capable of being armed, noting that 10 24-pounder smoothbore cannon had already been distributed.⁴⁹ The guns had in fact already been sent to the island as early as February 1842.⁵⁰ The extent to which the guns were mounted is unclear. James Glen Wilson's oil painting of Pinchgut circa 1850 shows only one gun and it is lying on the ground (**Figure 7**). The painting demonstrates a major flaw in the design of the battery. The height of the parapet is about the same height as the two men shown in the painting and was reported as only 16 feet above the high-water mark. As pointed out by Mulcaster, attacking ships could approach on all sides and rake the gunners with grapeshot.⁵¹ Much of the original parapet was incorporated into the terreplein and barracks building of Fort Denison and can still be seen today.

³⁷ *The Australian*, 17 November 1840, p.3.

³⁸ *Sydney Herald*, 28 December 1840, p.2.

³⁹ *Sydney Herald*, 28 January 1841, p.3

⁴⁰ *Sydney Herald*, 1 November 1843, p.2.

⁴¹ *Sydney Herald*, 15 December 1840, p.2

⁴² *The Australian*, 31 December 1840, p.2

⁴³ *Sydney Gazette and New South Wales Advertiser*, 1 July 1841, p.2.

⁴⁴ *Sydney Herald*, 16 December 1841, p.2.

⁴⁵ *Sydney Morning Herald*, 10 November 1842, p.2.

⁴⁶ Kerr 1986, p.14.

⁴⁷ *Sydney Herald*, 4 August 1841, p.2.

⁴⁸ *Sydney Herald*, 17 March 1842, p.2.

⁴⁹ Kerr 1986, p.14.

⁵⁰ *Sydney Herald*, 9 February 1842, p.2.

⁵¹ Kerr 1986, pp.12-13

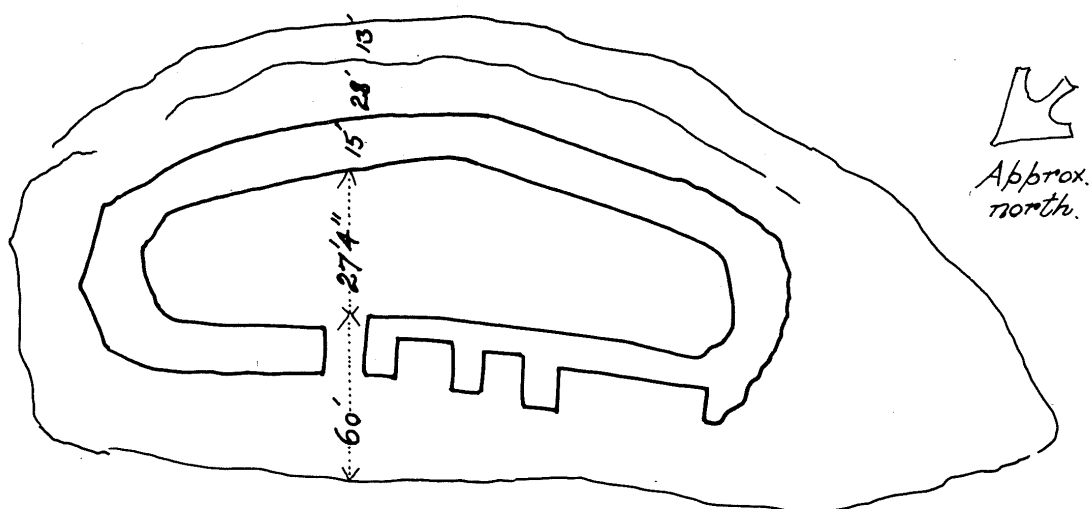


Figure 6 Sketch plan of Pinchgut battery, probably by Henry Lugard, between 1842 and 1844. Redrawn from ML B1441 by JS Kerr (Kerr 1986, p.12)



Figure 7 Sydney Harbour from the old fort, circa 1850 (James Glen Wilson, National Library of Australia, a5325001h)

While works were in progress, support for the new defences at Pinchgut Island and Bradleys Head was generally positive. The *Sydney Herald* described the works as ‘grand points of defence’.⁵² The *Free Press and Commercial Journal* called the defences ‘indispensable’ (sic) and expressed their enthusiasm for the works through poetry:

If the French should attempt to invade our fair Port,
We’ll not listen long to their blarney,
A few pills from Pinchgut will shorten the sport,
If they once get acquainted with Barney.⁵³

Not everyone however was convinced of the effectiveness of the new defences. In a letter to the editor ‘One of the Has-Beens’ expressed his concern:

One frigate, with a couple of sloops of war, might with ease enter Port Jackson, burn the shipping in the harbour, and set fire to the town in despite of our sixty pieces of ordnance...⁵⁴

⁵² *Sydney Herald*, 12 February 1841, p.2.

⁵³ *Free Press and Commercial Journal*, 13 February 1841, p.2.

⁵⁴ *Sydney Gazette and New South Wales Advertiser*, 12 February 1842, p.2.

'A Briton' considered that a fleet of warships would better serve to defend the colony and supersede the defenceless batteries of Fort Macquarie, Pinchgut and Bradleys Head.⁵⁵

Meanwhile, Barney had been drilling 100 soldiers from the local garrison to serve on the guns, but this was only a short-term solution given that it was less than half the number needed to serve the 26 24-pounder guns now mounted at Pinchgut, Fort Macquarie, Bradleys Head and Dawes Battery. The garrison would inevitably be transferred to their next Imperial station and they were not authorised to carry out any actual firing practice. A request in 1842 for two companies of Royal Artillery to man the defences only served to alert the Home Government that the colony had been undertaking unsanctioned works.⁵⁶

In November 1842, in consequence of orders received from the Home Government, the works on Pinchgut Island and Bradleys Head were discontinued. The House of Commons, while finally approving a sum of money for the works carried out to date would not vote any additional sum in the Ordnance Estimates to complete the works. Barney, in 1841 had submitted plans and estimates for additional work on Dawes Battery, Fort Macquarie and Bradleys Head and a single gun Martello tower on the outer-lying Sow and Pigs Reef, but these like the proposed works at Pinchgut, were rejected.⁵⁷

Public reaction in the newspapers was mixed. 'Curacoa' wrote 'In the whole range of the colonial possessions of Great Britain, no one place can be pointed out so defenceless as Sydney...' ⁵⁸, while 'Blue Ruin' thought the works should never have commenced, as the best place for fortification of the port was at the entrance; namely North Head, Middle Head and South Head.⁵⁹ The *Sydney Herald* stated its belief that the works at Pinchgut should proceed.⁶⁰

Criticism was also levelled at the aesthetic impact on the landmark island. The island was described as 'a hideous blot upon our water'⁶¹, 'barbarously and ignorantly destroyed'⁶² and an 'unsightly mass of rock'.⁶³

Amidst this unresolved controversy, Barney was replaced as Commanding Royal Engineer by Lieutenant-Colonel James Gordon. One of Gordon's first tasks was to provide an explanation and justification for Barney's 'unsanctioned' works. Given the suggested antipathy between the two rival engineers⁶⁴ it must have pleased Gordon to read continued criticism of Barney's works. The *Australian* described the defences as the 'What-d-ye-call-it' at Bradleys Head, Fort Macquarie as untenable, Fort Phillip as a salutation pop-shop...' and:

with respect to mutilated Pinchgut, its works have been as frequently and as severely cut up as its substance has been barbarously and ignorantly destroyed.⁶⁵

The *Sydney Chronicle* found that the only result of the defence works was the reduction of Pinchgut Island to an unsightly mass of rock⁶⁶ and 'Pinguttina' in her letter to the editor decried:

A few years back I was an object of admiration to all who visited the waters of Port Jackson; but alas, in an unhappy hour I became the victim of a designing Colonel of Engineers, who most ruthlessly despoiled me of my charms, and has left me 'a mark for the finder of scorn to point at.'⁶⁷

⁵⁵ *Sydney Morning Herald*, 23 September 1843, p.3.

⁵⁶ Kerr 1986, p.14.

⁵⁷ Kerr 1986, pp.13–14.

⁵⁸ *Sydney Morning Herald*, 15 September 1843, p.4.

⁵⁹ *Sydney Morning Herald*, 20 September 1843, p.4.

⁶⁰ *Sydney Morning Herald*, 29 November 1844, p.2.

⁶¹ *Sydney Morning Herald*, 14 May 1847, p.2.

⁶² *The Australian*, 24 July 1847, p.2.

⁶³ *Sydney Chronicle*, 11 August 1847, p.2.

⁶⁴ See Kerr 1986, p.15.

⁶⁵ *The Australian*, 24 July 1847, p.2.

⁶⁶ *Sydney Chronicle*, 11 August 1847, p.2.

⁶⁷ *Sydney Morning Herald*, 5 May 1854, p.5.

Despite the halt to works in 1843 Pinchgut Island was appropriated by the Ordnance Department for defence of the harbour of Port Jackson.⁶⁸

Gordon reported to the Colonial Secretary that the harbour's only completed work of defence, Fort Macquarie, was not effective as a coast battery and that Pinchgut Island and Bradleys Head, if completed, would be quite inadequate for the defence of Port Jackson.⁶⁹ Instead, his 1848 plan for the defence of Sydney Harbour proposed major defences at inner South Head and Middle Head and a casemated tower, terreplein and barracks at Sow and Pigs Reef. Despite his earlier criticism of the inner defences, he acknowledged the possibility that a ship could force passage with a leading wind and favourable tide, especially during the night,⁷⁰ and thus he also proposed to retain the fortifications on Bradleys Head, install heavier guns at Dawes Battery and construct a Martello tower and terreplein on Pinchgut, each with one heavy gun.⁷¹

Gordon's six-year term coincided with an economic depression in the colony and a period of relative international stability which made it even less likely that the Home Government would approve the expenditure. In 1849 the Secretary of State for the Colonies informed the Governor that the Office of Ordnance in the colony would be closed, all military land and buildings would be transferred to the Colonial Government and all military expenses apart from the Imperial troops' pay would be borne by the Colonial Government. In 1851 Colonial Architect Edmund Blackett accepted the harbour defences on behalf of the Colonial Government and documented their status:

Dawes Battery:	Unarmed and unfinished
Fort Phillip:	A saluting battery
Fort Macquarie:	Barbette battery mounting 10 24-pdrs
Pinchgut:	Commenced 1841 – discontinued
Garden Island:	Intended as a battery – nothing came of it
Bradleys Head:	An incomplete battery mounting six 24-pdrs on iron carriages. ⁷²

The Colonial Government refused to contribute to defence spending until it received control of its own revenue and no improvements were made over the next two years. When in 1853 the colony was given control of its own revenue, and boosted by the discovery of gold, the NSW Legislative Council appointed a Select Committee to examine the defence needs of Port Jackson. One of the committee members was Lieutenant-Colonel George Barney. Barney was now Chief Commissioner of Crown Lands and a member of the NSW Legislative Council, having sold his commission, taken up a role as superintendent of a settlement in Queensland and then returned to Sydney after the settlement was abandoned.⁷³

The 1853 Select Committee took evidence from two military men stationed in Sydney: a Royal Navy captain and the commander of the 11th Regiment, and recommended that the entrance of the harbour be fortified 'with all convenient speed'. The Executive Council subsequently approved Governor Fitzroy's proposal to implement Gordon's 1848 plan for defences and in October 1853 Barney was appointed to take charge of all defence works with priority given to Middle Head and South Head. In June 1854 news arrived of Britain's declaration of war on Russia, three months after the Crimean War began. At the same time Barney reported that he had completed two-thirds of the excavation and a temporary battery of three 32-pounders at Middle Head and installed a battery of four 24-pounders at a location opposite the Sow and Pigs floating light.⁷⁴ In his report Barney also stated construction of a tower on Pinchgut as proposed by Gordon was urgently required.⁷⁵

⁶⁸ *Sydney Morning Herald*, 23 October 1843, p.2.

⁶⁹ *Sydney Morning Herald*, 23 June 1847, p.3.

⁷⁰ Oppenheim, p.42.

⁷¹ Kerr 1986, pp.17–18.

⁷² Oppenheim, pp.44–45.

⁷³ Kerr 1986, p.19

⁷⁴ Oppenheim, pp.49–54.

⁷⁵ *Empire*, 16 June 1854, p.1.

The new Governor Sir William Denison arrived in Sydney in January 1855. Denison was a Peninsular War veteran and former Commanding Royal Engineer and Governor in the West Indies, where Barney had been one of his engineer officers. Denison also immediately advised the Colonial Government that priority should be given to protecting the anchorage of the inner harbour. Denison dismissed the possibility of an attack on the harbour by another nation for the purpose of landing troops and argued that the outer harbour defences would offer no guarantee in any case against such an attack or be able to resist it. He also argued that in the event of an attack by a raiding fleet that Gordon's proposed defences would be inadequate to stop vessels entering during a fleet engagement or at night, leaving the inner harbour vulnerable to attack.⁷⁶ Denison recommended completion of Dawes Battery on a large scale, erection of a strong work on Pinchgut with heavy batteries on each side at the north shore and end of the Domain. The Colonial Government deferred to Denison, suspended works at Middle Head and South Head and instructed that the original inner harbour defences be continued.⁷⁷ On 23 August 1855, the Legislative Council voted £16,500 for construction of a battery, tower and barracks on Pinchgut Island.⁷⁸

Not everyone was convinced of this decision. A letter to the editor of the *Empire* referred to the previous works on Pinchgut as Barney's folly and suggested the name of the island be changed to 'Pinch-gate'.⁷⁹ In the Legislative Council Mr Cowper stated his belief that the locations for the inner harbour defences were very objectionable and that he was not convinced that the Governor's scheme was the best one.⁸⁰ The *Sydney Morning Herald* questioned why after years of mature deliberation the outer defences had been abandoned and cited the opinion of an officer of rank that the locations of two of Barney's previous attempts had been ill-chosen and the opinion of a Royal Navy captain that defences at the Heads would lock up all of Port Jackson.⁸¹

Nevertheless, 15 years after Barney had first started work on his unsanctioned 'folly' he was given approval to complete it.

Steam, screws, steel and shells

To understand fortification design in the mid-19th century it is important to appreciate the rapid technological improvements made to ships of the line, or battleships, over a thirty-year period from the 1840s to the 1870s.

During the 1840s Britain started to apply steam propulsion to its navy and converted a few small traditional sailing ships of the line into jury-rigged floating batteries called 'blockships' with medium-sized steam-engines for speeds of up to 8.9 knots.⁸² In 1843 the Royal Navy launched the first screw-propelled warship, the steam sloop HMS Rattler, which was armed with one 8-inch gun and eight 32-pounders and had a speed of 9.6 knots.⁸³ Both Britain and France then launched steam frigates, the French Pomone in 1845 and the British HMS Amphion a year later. The latter had 36 guns consisting of 8-inch guns, 68-pounders and 32-pounders but a speed of under seven knots.⁸⁴

The launching of the Napoléon by France in 1850 began an arms-race in battleships that would last nearly 100 years. Napoléon was the first purpose-built sail and steam battleship to be propelled by a screw. With 90-guns, including 58 30-pounders, she could attain speeds of up to

⁷⁶ Oppenheim, p.55.

⁷⁷ Kerr 1986, p.20.

⁷⁸ *Sydney Morning Herald*, 3 September 1855, p.5.

⁷⁹ *Empire*, 7 March 1855.

⁸⁰ *Sydney Morning Herald*, 3 August 1855, p.3.

⁸¹ *Sydney Morning Herald*, 7 April 1855.

⁸² Wikipedia, *French battleship Napoleon*, accessed 7 August 2017.

⁸³ Wikipedia, *HMS Rattler*, accessed 7 August 2017.

⁸⁴ Wikipedia, *HMS Amphion*, accessed 7 August 2017.

14 knots and had enough coal to sail for nine days at top speed,⁸⁵ out-pacing but not out-gunning all existing warships. Battleships could now manoeuvre independently of the wind.

During the first half of the 19th century there had been few significant changes to artillery and a gunner of 300 years earlier would have encountered little difficulty in operating the guns of that period. When lawyer and engineer William Armstrong read of the difficulties experienced by the British Army in moving heavy guns through the mud of the Crimean War battlefields, he applied industrial-era scientific methods to gun construction and in 1855 delivered to the army a new type of gun. It was constructed not of one lump of cast-iron but built up from a number of wrought iron hoops, heated, expanded and shrunk on the barrel. He incorporated rifling – deep spiralling grooves within the barrel – in which lugs on a heavier elongated and pointed shell would ride and spin as it left the barrel, increasing accuracy, range and pay-load. Lastly the gun was loaded from the rear, or breech and thus was much faster to load and fire. Armstrong's gun was successfully trialled, he was appointed 'Engineer for Rifled Ordnance to the War Department' and 'Superintendent of the Royal Gun Factory at Woolwich Arsenal' and his guns and developments were exported across the world.⁸⁶

The Crimean War gave the major powers an opportunity to test other technologies. The 1853 Battle of Sinop demonstrated the superior effectiveness of Russian explosive shells over the Ottoman smoothbore projectiles and was the last major battle between fleets of sailing ships⁸⁷, while the French deployed floating ironclad batteries to successfully destroy Russian coastal fortifications in the Battle of Kinburn in 1855.⁸⁸

These improvements (steam, screws, steel and shells) were brought together in the launching in 1859 of the first ocean-going ironclad warship, the French wooden-hulled Gloire. With 36 6½-inch rifled muzzle-loading (RML) guns, a speed of 11 knots and range of 4000 kilometres, Gloire rendered obsolete all wooden ships of the line and started an invasion scare in Britain as the Royal Navy lacked any ships that could counter Gloire and her two sister ships.⁸⁹

Gloire's dominance was short-lived. Britain responded in 1860 by launching the steam-powered HMS Warrior, the world's first iron-hulled ironclad warship. The armoured frigate carried 26 muzzle-loading 68-pounders, 10 rifled breech-loading 110-pounders and four rifled breech-loading 40-pounders. Warrior was designed to use superior speed to force and then control the range of the battle. With a speed of up to 17 knots under both steam and wind and 114 millimetre thick armour she was faster and better protected than any rival and the British Admiralty ceased production of wooden ships of the line.⁹⁰ Within two years, Italy, Austria, Spain and Russia had all ordered ironclad warships.⁹¹

Following the launch of Gloire the British Army and Navy found that the breech-closing system was not strong enough to withstand the explosive force needed for a shell to penetrate iron cladding. Armstrong developed an RML gun and these were introduced in the mid-1860s.

HMS Devastation, launched in 1871, was the first ocean-going capital ship that did not carry sails and the first which had the main armament (four 12-inch RML guns) mounted on top of the hull rather than inside it. Even with external armour plating 250–360 millimetres thick she could reach a speed of nearly 14 knots.⁹²

As the thickness of iron cladding increased so did the size of the RML guns, culminating in 1877 in the 103-ton 17.72-inch gun capable of firing a 910-kilogram shell and remaining in

⁸⁵ Wikipedia, *French battleship Napoleon*, accessed 7 August 2017.

⁸⁶ Ian V Hogg, *The Illustrated Encyclopedia of Artillery*, 1987.

⁸⁷ Wikipedia, *Battle of Sinop*, accessed 7 August 2017.

⁸⁸ Wikipedia, *Battle of Kinburn*, accessed 7 August 2017.

⁸⁹ Wikipedia, *French ironclad Gloire*, accessed 7 August 2017.

⁹⁰ Wikipedia, *HMS Warrior*, accessed 7 August 2017.

⁹¹ Wikipedia, *Battleship*, accessed 7 August 2017.

⁹² Wikipedia, *HMS Devastation*, accessed 7 August 2017.

service until 1906. The last two decades of the 19th century saw rapid improvements to artillery including a successful breech-closing mechanism and hydraulic recoil control which improved range and accuracy and RML guns were phased out in favour of breech-loading guns.⁹³

The basic template for battleships was created with *Devastation*. Improvements continued to be made culminating 70 years later in the launch of the heaviest battleship of all time, the Japanese *Yamato*, with its massive 18-inch rifled breech-loading guns. The *Yamato* only ever fired its main guns once at an enemy target before it was sunk by American aircraft carrier-based bombers. Air-power had rendered battleships obsolete.

2.4 Construction of Fort Denison

Tenders were called for the new fortifications at Pinchgut, Dawes Battery and Lady Macquarie's Chair in September 1855. Barney was appointed in charge of the works with William Coles as Superintendent of Works, Thomas Price as Foreman of Works, James Hindmarsh as Clerk and two men of the 11th Regiment as boatmen. The contract for masonry was awarded to William Randle who also successfully tendered for the carpenters and joiners work in December 1855.⁹⁴ Tenders for painters and glaziers work were released in January 1856.⁹⁵

Barney's initial design for Pinchgut, as described in detail in 1855, consisted of three main components: a battery of 12 guns in a terreplein, a tower containing two guns on traversing platforms, accommodation in the tower for 14 men and a magazine in the tower basement, and a separate casemated barracks for two officers and another 44 men. By January 1856 though, the *Maitland Mercury and Hunter River General Advertiser* reported that the tower would be mounting four guns, suggesting that the decision to mount only one gun on top of the tower and three additional 32-pounder guns in the middle barracks level was made soon after the original tenders had been released.⁹⁶ In March 1856 the works were described as 'in a forward state' and the barracks completed⁹⁷, while by April the tower had been constructed to a height of 10 feet.⁹⁸

In June 1856 Barney reported that sufficient land had been reclaimed to accommodate additional guns: two on the southern end and one on the northern end behind the tower. Barney provided the Colonial Secretary with an estimate to construct the additional works and the Executive Council was asked to consider the plans for the additional works in December 1856.⁹⁹

The keystone of the last arch of the tower basement was laid during a ceremony on the island in July 1856. The stone was inscribed with the names of those involved in the construction of the fort: Governor Denison, Barney, Coles, Randle, Price and J Carlisle (**Figure 8**). After the stone-laying, the workmen were provided with refreshments and allowed to take a holiday for the rest of the day, while Barney, Randle and friends took refreshments in one of the unfinished officers' rooms.¹⁰⁰

⁹³ Hogg, 1987.

⁹⁴ Kerr 1986, pp.21–26.

⁹⁵ *New South Wales Government Gazette*, 25 January 1856, p.227.

⁹⁶ *Maitland Mercury and Hunter River General Advertiser*, 23 January 1856, p.3.

⁹⁷ *Sydney Morning Herald*, 1 March 1856, p.4.

⁹⁸ *Sydney Morning Herald*, 16 April 1856, p.4.

⁹⁹ *Empire*, 23 December 1856, p.2.

¹⁰⁰ Kerr 1986, p.27.



Figure 8 The keystone of the magazine arch (R Newton/OEH 2017)

In January 1857, the key stone to the tower dome was lowered into place by Cole and the workmen partook of the usual festivities.¹⁰¹ By April 1857 the fort on Pinchgut was nearing completion and a detailed description was provided by the *Sydney Morning Herald*:

It consists of a Martello tower, 51 feet high, a battery, a barracks, magazine, stores, &c. The basement storey of the tower comprises gunners' stores and magazine, and consists of a continuous vaulted arch, springing from a centre pier, built in solid stone five feet in diameter; the walls on the outside are 12 feet 8 inches in thickness, built in the most substantial manner in cement, the stones employed each weighing several tons. The magazine is covered in a casemate arch, every precaution has been taken to make it entirely bomb-proof. The next story consists of a very fine vaulted room, with four embrasures and it mounts three 32-pounders and one 12-pounder, commanding the harbour in all directions. The next story brings us to the top of the tower...On this top story, which is an open platform there will be mounted (as soon as they arrive) two guns en-barbette, which can of course be shifted to command any part of the harbour. In parts of the tower there are musket holes which serve as ventilators and so constructed as to give a wide range to those firing from the inside and render it almost impossible for those outside to fire a shot at them...It is intended to make this tower useful in times of peace, by erecting on it lanterns, that it may act as a lighthouse. The battery... will mount...ten guns.

The article also provided a detailed description of the barracks:

...there is also erected a row of solid stone vaulted roof-rooms, for the accommodation of men and officers. These rooms are fitted with the necessary accoutrement racks, &c, for 58 men and two officers, but they are capable, in case of necessity, of accommodating double that number. Kitchens, fitted with every possible necessary, are provided; and last, though by no means least, a tank has been cut in the solid stone 12 feet deep, 30 feet long and 15 feet wide, capable of containing 26,000 gallons of water which is obtained from this well by means of a pump. Before coming from it, however, it passes through charcoal, is thus thoroughly filtered, and is, without exception, equal to any water to be obtained in Sydney.¹⁰²

The sandstone for the fort was reported to have been sourced from Thrupp's quarry on Kurraba Point¹⁰³ and it was estimated that 8000 tons of stone were used to construct the tower.¹⁰⁴

A testimonial to the foreman of works John Carlisle was held on 13 July 1857 where 50 guests, mostly masons, presented Carlisle with a gold signet ring inset with a blood stone. It was stated to be the first time in the colony that such a testimonial had been presented by a body of workmen to

¹⁰¹ *Sydney Morning Herald*, 13 January 1857, p.6.

¹⁰² *Sydney Morning Herald*, 9 April 1857, p.6.

¹⁰³ Kerr 1986, p.26.

¹⁰⁴ *Armidale Express and New England General Advertiser*, 2 May 1857, p.3.

their foreman. The ring was engraved 'To Mr John Carlisle as testimonial by the workmen on Pinchgut Island, 1857.'¹⁰⁵

Reference to 'Fort Denison' was made as early as September 1857, when 'Squeeze-stomach' wrote to the editor of the *Sydney Morning Herald* and suggested the name as a means of obliterating the 'coarse and vulgar convict-smelling name'.¹⁰⁶ In response 'GK' proposed that the fort be named 'Fort Cook' as no memorial existed to commemorate the great navigator.¹⁰⁷ On 15 October though, the government designated the island 'Fort Denison' in compliment to the Governor.¹⁰⁸

In August 1858 Barney called for tenders for masons' and carpenters' work on Fort Denison, also for the supply of 11 32-pounder garrison carriages and 21 wooden platforms.¹⁰⁹

Mounted sometime before December 1858¹¹⁰ the guns consisted of the following:

- one 8-inch shell gun on a traversing carriage on the top of the tower
- three 32-pounder shot guns on garrison carriages in the tower
- one 12-pounder carronade in the tower
- nine 32-pounder shot guns on dwarf traversing platforms in the terreplein battery (**Figure 9** and **Figure 10**)
- one 10-inch shell gun on a traversing carriage en-barbette
- one 10-inch shell gun on a dwarf traversing platform in embrasure.¹¹¹



Figure 9 The 10-inch shell gun (left of image) and 32-pounder gun battery on Fort Denison, circa 1859. The image shows several enlisted men of the Royal Artillery garrison and the water tank pump (Wilson, State Library of NSW, a5325001u)

¹⁰⁵ *Sydney Morning Herald*, 15 July 1857, p.5.

¹⁰⁶ *Sydney Morning Herald*, 17 September 1857, p.5.

¹⁰⁷ *Sydney Morning Herald*, 18 September 1857, p.3.

¹⁰⁸ *NSW Government Gazette*, 16 October 1857, p.1964.

¹⁰⁹ *Empire*, 25 August 1858, p.1.

¹¹⁰ Kerr 1986, p.29.

¹¹¹ *Sydney Morning Herald*, 13 May 1859, p.9.



Figure 10 Fort Denison 1879, showing the 32-pounders on dwarf traversing carriages and the 10-inch shell gun en-barbette (91/1323-6 Collection: Museum of Applied Arts and Sciences. Photo: Chris Brothers)

All guns were smoothbore muzzle-loading (SBML) but with varying range (**Table 1**). The guns could fire solid round shot, grape shot or case shot. The carronade was a smaller gun with comparatively large calibre and thus designed to fire at short ranges only and almost obsolete by 1858. Shell guns had the added advantage of being able to fire hollow explosive shot, called shells. A normal gun crew for a heavy gun, including the 32-pounders and shell guns, consisted of 10 men.¹¹²

Table 1 Muzzle-loading guns used in Port Jackson's defences

Years of production	Type	Projectile	Maximum range (metres)
1720s to 1820s	24-pounder SBML	10.8 kg solid shot	2,023
1720s to 1820s	32-pounder SBML	14.5 kg solid shot	2,651
1820s to 1854	8-inch SBML	23 kg explosive shell	3,000
1820s to 1854	10-inch SBML	10-inch explosive shell	3,000
1841 to 1861	68-pounder SBML	27 kg shot or explosive shell	2,900
1863 to 1872	80-pounder RML	36 kg shell	3,720

¹¹² Kerr 1986, pp.30–33.

Years of production	Type	Projectile	Maximum range (metres)
1866	8-inch gun RML	79 kg shell	2,736
1868	10-inch gun 25-ton RML	186 kg shell	7,290

In May 1859 it was reported that Mr Goddard had recently completed the ditch and a solid seawall at the rear of Fort Denison, and was now constructing loophole flank defences consisting of guard houses and open buildings to protect riflemen.¹¹³ These chambers (now known as the Tide Gauge Room and West Room) were protected positions from which riflemen could direct small arms fire at enemy landing parties as well as providing additional accommodation¹¹⁴ (**Figure 11**). By the end of 1859 total expenditure on the fort had increased from the original estimate of £16,550 pounds to £26,962 pounds and the fort was still listed as unfinished.¹¹⁵



Figure 11 Fort Denison after completion of the 1859 loophole flank defences and seawall (Star Photo, State Library of NSW, a089117u)

By the end of 1858 heavier guns had also been mounted in the other fortifications of the inner harbour:

Dawes Battery	Five 42-pdr and fifteen 32-pdr ML guns
Kirribilli Point	Five 8-inch ML guns
Macquarie Point Battery	Two 10-inch ML guns
Fort Macquarie	11 24-pdr and six 6-pdr ML guns, one 12-pdr carronade

¹¹³ *Sydney Morning Herald*, 13 May 1859, p.9.

¹¹⁴ Kerr 1986, p.29.

¹¹⁵ Kerr 1986, p.26.

Bradleys Head

Six 24-pdr ML guns.¹¹⁶

Denison departed from Sydney in January 1861 to take up his new role as Governor of Madras. During his six years as Governor of New South Wales he had authorised expenditure of over £60,000 on his inner harbour defence scheme. On paper at least, the 67 guns of the inner fortifications appeared formidable, but even before they were completed technological innovations in Britain and France were rendering the inner fortifications obsolete. Less than 10 years later they would be abandoned in favour of the outer harbour defences that Denison and Barney had considered so inadequate. Barney died in May 1862 aged 70 and Denison in 1871 aged 66.

The rapid changes in warship armour and guns were not lost on the public. In 1860 the *Sydney Morning Herald* surmised that if attacked by an armoured ship Fort Denison's cannonballs would 'rebound like a racquet ball' and one broadside would level the fort.¹¹⁷ Two years later the paper acknowledged the power of the new Whitworth Armstrong guns and was in no doubt the fort would fall after the first broadside of the latest guns.¹¹⁸ The *Empire* considered Pinchgut as a 'mere toy, utterly useless as a fort' and thought the Sow and Pigs Reef would be a source of more terror to privateers than all the present means of defence in Sydney.¹¹⁹ The *Empire* continued its attack by describing the works on Pinchgut and Kirribilli Point as 'a lasting testimony to the wavering and imbecile policy of our political engineers.'¹²⁰

Under such attack, the new Governor Sir John Young called for a report on the defences of Sydney. Royal Engineer Captain Ward's report identified that the number of men available to man Sydney's defences was sufficient for only three defences – Dawes Battery, Mrs Macquarie's Point and Fort Macquarie, and at the approach on an enemy Fort Denison and Kirribilli Battery must be abandoned. Only 45 of the men available were professional artillerymen, the other 310 were volunteers.¹²¹

This was followed by a Select Committee in 1865 and yet another in 1867. The 1867 Committee was composed of three generals, two admirals and two other officers, who recommended the dismantling of Kirribilli, Fort Denison and Mrs Macquarie's Point.¹²² One of the witnesses credited with providing information was Major General James Gordon RE, who had inherited Barney's first attempt at fortifying Pinchgut 20 years earlier¹²³. The fort was however not dismantled, as it had become invaluable for several other uses.

The Martello tower

Martello towers derive their name from a 16th century tower fort on Mortella Point in Corsica. In February 1794 two warships, HMS *Juno* (74 guns) and HMS *Fortitude* (32 guns), were sent to secure the anchorage for a British invasion of the island but were repelled by the 32-strong French garrison firing heated shot from its two medium 18-pounder guns with *Fortitude* suffering significant damage. The garrison surrendered to land forces after two days of heavy fighting. The British recorded the tower (**Figure 12**) before blowing it up two years later when they abandoned the island.¹²⁴ The Italian 'mortella' (myrtle) was corrupted to 'martello' and became the name by which the later towers were known.¹²⁵

¹¹⁶ Oppenheim, p.64.

¹¹⁷ *Sydney Morning Herald*, 30 November 1860, p.4.

¹¹⁸ *Sydney Morning Herald*, 17 April 1862, p.4.

¹¹⁹ *Empire*, 22 May 1862, p.5.

¹²⁰ *Empire*, 26 June 1863, p.4.

¹²¹ *Sydney Morning Herald*, 3 February 1863.

¹²² Oppenheim, p. 81.

¹²³ Kerr 1986, p.30.

¹²⁴ https://en.wikipedia.org/wiki/Martello_tower, accessed 12 September 2017.

¹²⁵ <http://collections.rmg.co.uk/collections/objects/105772.html>, accessed 29 August 2017.

The design was adapted to defend the English coastline from the threat of invasion after war with France renewed in 1803. A defensive network of 103 towers was developed in two phases: those in East Sussex and Kent built between 1805 and 1808, and those in Essex and Suffolk built between 1809 and 1812. The southern towers were usually circular or near circular in plan with an average height of 10 metres and containing three levels built in brick and often rendered. The tower walls are both massive and battered to resist cannon fire. The open top floor contained a single swivelling cannon within a deep embrasure and was supported by a massive central pillar. The middle floor served as barracks while the lower floor held the magazine, stores and a water cistern. Access between levels was by means of a trapdoor. Some towers were supported by batteries and dry and/or water filled moats. The east coast towers were oval in plan with a thicker wall facing the direction of fire and three guns on the top of the tower within a clover-shaped embrasure, usually a 24-pounder cannon and two shorter guns. The tower also had an internal staircase to assist transfer of shot and powder from the magazine to the guns.

Three Martello towers were constructed in Scotland, some in Wales, about 50 in Ireland and many more throughout the British Empire and other occupied territories including Jersey, North America, the Caribbean, Spain, South Africa, Mauritius and Australia.¹²⁶

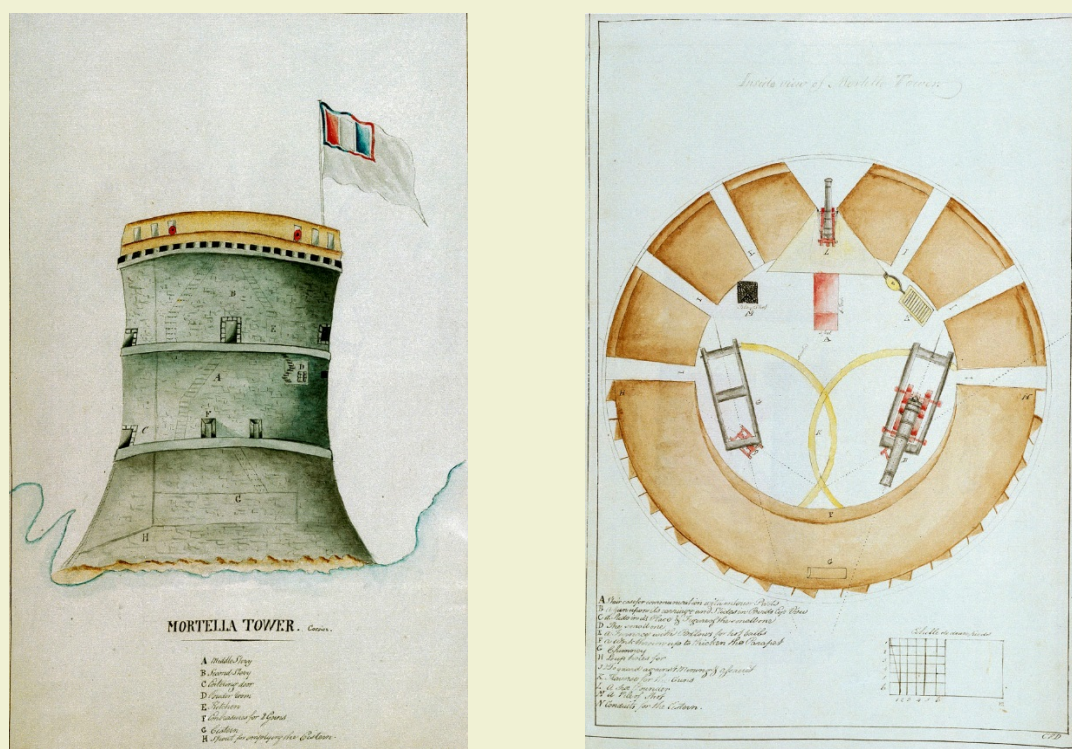


Figure 12 Elevation and inside view of the tower on Mortella Point which inspired the construction of over 100 British Martello towers (© National Maritime Museum, Greenwich, London)

2.5 Fort Denison in the 19th century

During the 19th century, Fort Denison was occupied by four different artillery forces and utilised to provide several more enduring maritime and navigational functions.

2.5.1 The Royal Artillery Garrison

In July 1855, as Governor Denison was initiating his inner harbour defence scheme, he had at his disposal no permanent artillery force and only 85 artillery volunteers, of which only 25 to 30 were considered effective. This small force was sufficient to service no more than 14 guns if a crew of six gunners was assigned to each gun. In September 1855, the same month as tenders were called for

¹²⁶ https://en.wikipedia.org/wiki/Martello_tower, accessed 12 September 2017.

the construction of the fort on Pinchgut, Governor Denison sent a report to the Secretary of State for the Colonies requesting a company of the Royal Artillery to be stationed in Sydney. After lengthy correspondence Denison's request was accepted and in October 1856 Royal Artillery 3rd Company of seven Battalion arrived in Sydney. The company under command of Captain Lovell consisted of three officers, 115 non-commissioned officers and privates, with 41 women and 62 children.¹²⁷ Under Royal Warrant, only 12 soldiers in every company of 100 men leaving on overseas service were permitted to marry and be provided for by the army, so it is likely that most of the soldiers' wives and children would have lived off barracks and at the soldiers' expense.

A garrison of Royal Artillery gunners was assigned to Fort Denison. At the time of the fort's construction, 'Tommy Atkins', as the British Army soldier was colloquially known, was provided with a barrack room containing a single iron bedstead, an iron accoutrements rack on the wall above the bed, a communal central table with bench seats and a fireplace (**Figure 13**). Non-commissioned officers could own a box to hold some personal possessions, but privates were discouraged from owning anything other than that supplied by the army, all of which was marked with a broad arrow and the unit's number. The regulation British Army barrack space was a mere 450 cubic feet per man though this was increased to 600 cubic feet in 1858.¹²⁸ Fortunately for the gunners stationed on the fort, the garrison never exceeded 25 gunners though it did include at least four of the gunners' families. Three births were recorded on the fort between 1858 and 1863¹²⁹ and five-year-old Fanny McLean, who died in 1859 following an horrific merry-go-round accident was the daughter of one of the gunners on Fort Denison.¹³⁰ Wives were permitted to be issued bedding and children were entitled to draw bedding in 1856. Like all aspects of army life, use of the barracks room was regulated, but soldiers could introduce some decorations to make the barracks more homely.

¹²⁷ Kerr 1986, p.36.

¹²⁸ Whitfield, Carol M, Barracks Life in the Nineteenth Century; or, How and Why Tommy's Lot Improved, *Material Culture Review / Revue de la culture matérielle*, [S.l.], June 1982, ISSN 1927-9264, available at: <https://journals.lib.unb.ca/index.php/MCR/article/view/17121/22867>, accessed: 28 November 2017.

¹²⁹ Kerr 1986, p.38.

¹³⁰ *Maitland Mercury and Hunter River General Advertiser*, 27 October 1859, p.3.



Figure 13 Recreation of a barrack room at Fort Nelson (Barrack room mock up Fort Nelson, Wikimedia Commons)

The army diet had changed little over the previous 50 years. Each man was issued a daily ration of one pound of bread, one pound of meat and one-third of a pint of spirits, usually rum. Wives drew half rations and children quarter rations. Each mess group would contribute part of their meagre pay towards purchase of tea, coffee, sugar, milk, and vegetables which the cook used to vary their diet. Meals were cooked in the boilers located at each end of the barracks on the fort. The boiler was a cast-iron 'cauldron', either 12 or 25 gallons with a sheet metal lid covering two-thirds of the top and a steam pipe running up into the chimney flue from the fixed one-third of the lid. The boilers were used to cook the meat and vegetables and also the tea and coffee.¹³¹ For a private with less than seven years' service, pay was poor. He received only one shilling a day, out of which he was required to pay three shillings a week for rations, necessaries and washing, leaving him with only sixpence a day. A sergeant received an additional sixpence a day.

Annual practice of the Royal Artillery took place on Fort Denison on 11 March 1859. Fifty-three rounds were fired at a 36-gallon cask placed at a range of 1500 yards: 10 from the two 10-inch guns, 10 from the 8-inch gun and 33 from three 32-pounders. The practice was complimented by the officers and visitors while a large number of spectators looked on from vantage points.¹³² Another 52 rounds were fired over two hours on 24 March with one of the shots from the 8-inch gun carrying away the flag from the target.¹³³ Firing at a target between Bradleys Head and Shark Island two miles from the fort, the target practice of 1860 was not as well received, with the media reporting that a hostile ship coming around Bradleys Head would have very little to fear from Fort Denison.¹³⁴ By July 1860, target practice was being held more regularly with better results achieved. In that month

¹³¹ Whitfield, 1982.

¹³² *Sydney Morning Herald*, 12 March 1859, p.3.

¹³³ *Sydney Morning Herald*, 25 March 1859, p.6.

¹³⁴ *Sydney Morning Herald*, 30 March 1860, p.4.

the target on the opposite shore was hit three times¹³⁵ and the gunners' aim in August was also very good, though the target had been moved much closer at 1000 yards.¹³⁶

In 1869 the British Government informed the NSW Governor that orders had been given to withdraw from Australia all infantry more than a single regiment. Then in 1870, the Governor was advised that the smallest force the British Government would be prepared to send to the Australian colonies was one regiment, and as the colonies' total requirements were less than one regiment, no further infantry forces would be sent. Furthermore, as artillery forces could not be left in a colony without infantry support all remaining Royal Artillery forces would also be withdrawn. In August 1870, the last British troops departed from Circular Quay.¹³⁷

2.5.2 The Volunteer Artillery

A volunteer artillery corps was established in 1854 but in its early years suffered from low morale and attendance. A detachment of the 1st Company of the Sydney Volunteer Artillery drilled at Fort Denison in October 1860 and their competence was seen as proof they would be able to fight alongside professional gunners.¹³⁸ In November 1861 only 50 volunteers of all ranks attended ball practice despite the threat of a fine unless a satisfactory reason for non-attendance was provided in writing.¹³⁹ The low number of volunteers was reflected elsewhere with only about 1000 men in all volunteer military forces in New South Wales in 1862.¹⁴⁰ Attendance at the 1864 shot practice was also low with only 34 of the 230 volunteers of Nos. 1 and 2 Battery attending.¹⁴¹ Nevertheless, the volunteers achieved surprisingly good results. Firing the 32-pounders at a moored half-ton vat with flag and staff 1700 yards distant, the gunners landed 21 of the 50 shots within a five-metre radius of the target with one shot taking out the flag (**Figure 14**). The volunteer artillery continued to hold annual shot practice into the 1870s with the offer of prize money contributing to increased attendance. The last recorded annual match on Fort Denison in 1876 attracted members from batteries 1, 3, 4, 5, 6, 7, 9, 10 and 11.

¹³⁵ *Sydney Morning Herald*, 19 July 1860, p.4.

¹³⁶ *Sydney Morning Herald*, 1 September 1860, p.5.

¹³⁷ Oppenheim, pp.82–87.

¹³⁸ *Sydney Morning Herald*, 16 October 1860, p.5.

¹³⁹ *Sydney Morning Herald*, 1 November 1861, p.1.

¹⁴⁰ *Empire*, 30 May 1962, p.4.

¹⁴¹ *Sydney Morning Herald*, 18 July 1864, p.4.

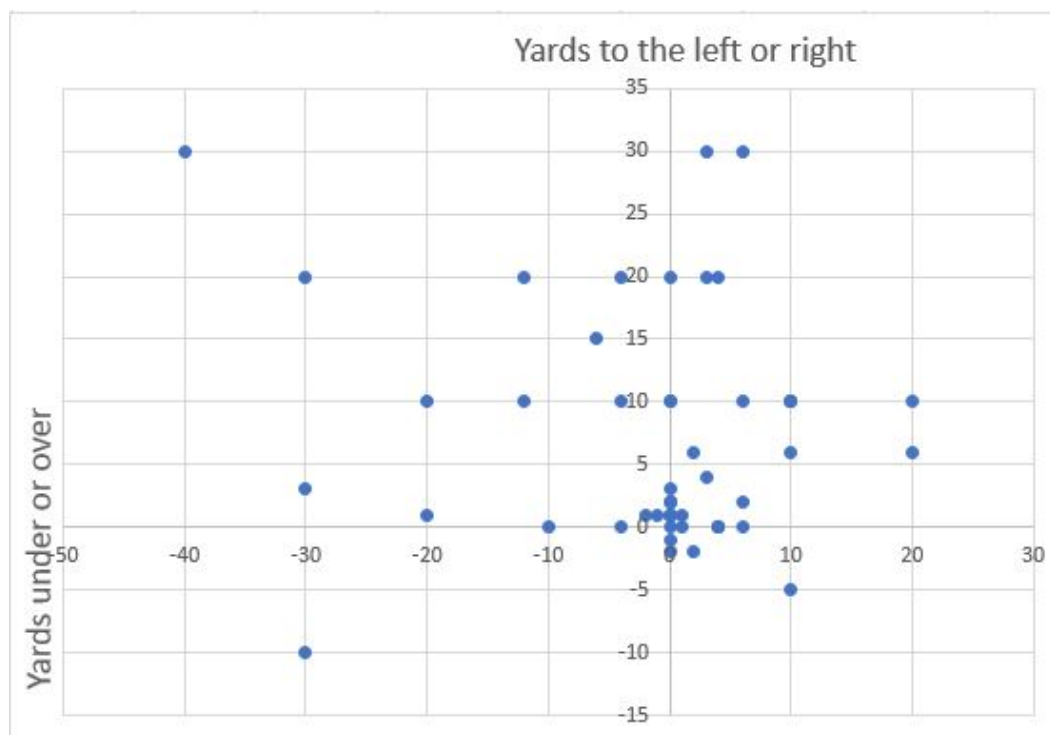


Figure 14 Results of shot practice, July 1864. Note: multiple hits on the same location are recorded only once

2.5.3 The NSW Naval Brigade

The partially-paid and land-based volunteer naval brigade was formed under government proclamation in May 1863 and initially consisted of three companies each of 40 men¹⁴² under command of Captain Hixson, RN. The Brigade's main role appears to have been the defence of Port Jackson.¹⁴³ On the night of 24 August 1866 Captain Hixson called out the naval brigade and at 8.10pm sent them to the forts including Fort Denison to see how long it would take for them to clear for action. No.1 Company fired from Fort Denison at 8.43pm and in total 15 rounds were fired from each harbour battery. The people of Sydney were 'startled almost out of their propriety'.¹⁴⁴ The Royal Artillery, who at that time were still occupying the fort, had been diligent in advertising their intentions to conduct firing practice and the event suggests a level of cavalier enthusiasm on behalf of Hixson. It appears that Hixson, who was also Superintendent of Pilots, Lighthouses and Harbour acquired Fort Denison for the naval brigade after the withdrawal of the Royal Artillery and the Brigade held annual matches, gun and rifle training during the 1870s. The Brigade numbered 250 men when it was inspected by the Commodore on Fort Denison in 1875.¹⁴⁵ In 1880 Fort Denison was referred to as a mere saluting and exercising battery¹⁴⁶ and there was little action on the fort for the next six years. In 1886 though, while Captain Hixson was on holiday overseas, the naval brigade under command of Captain Lindeman carried out a naval sham fight involving 500–600 men at Forts Denison and Macquarie.

The last reported gun practice took place on Fort Denison in 1887 using 10 guns including some of the 64-pounder rifled muzzle-loading guns from HMCS *Wolverine* which were mounted on the island. The concussion from the broadside was such that it shattered the red glass on the tower light and extinguished the light.¹⁴⁷ The fort was used as a saluting battery during notable events in 1899

¹⁴² www.navyhistory.org.au/the-new-south-wales-naval-forces-1863-1902/, accessed 29 August 2017.

¹⁴³ Kerr 1986, p.38.

¹⁴⁴ *Maitland Mercury and Hunter River General Advertiser*, 25 August 1866, p.4.

¹⁴⁵ *Sydney Mail and New South Wales Advertiser*, 4 December 1875, p.727.

¹⁴⁶ *Sydney Morning Herald*, 13 July 1881, p.3.

¹⁴⁷ *Sydney Morning Herald*, 18 August 1887, p.7.

including the swearing in of the new Lieutenant-Governor at Government House¹⁴⁸ and the arrival of Lord Beauchamp.¹⁴⁹ The guns in the battery were all removed between May 1899 and October 1900. There is no record why they were removed or where they went but it marked the end of the fort's association with the naval brigade and Captain Hixson.

2.5.4 The Permanent Artillery

In 1871 the NSW Government passed legislation empowering it to form permanent military and naval forces and soon after the NSW Artillery was raised, consisting of four officers, 14 non-commissioned officers and 80 gunners.¹⁵⁰ The involvement of the permanent artillery forces with Fort Denison remains unclear. A member of the permanent artillery defence force was recorded as living on the fort with his wife in 1871.¹⁵¹ In 1874 one of the 18 recorded offences by members of the Permanent Artillery which resulted in being sentenced to the cells included creating a disturbance at Fort Denison and using obscene language to the lightkeeper's wife.¹⁵²

2.5.5 Lightkeepers

In May 1858 a red oil burning navigation light was placed on the top of the tower, trialled and found to 'answer its purpose admirably'¹⁵³ (**Figure 15**). The light was exhibited constantly after June 1858. From 21 June a sergeant of the fort's garrison was placed in charge of the light on an annual salary of £24 and five shillings paid for by the Colonial Government with a private as an assistant on £14 and 11 shillings.¹⁵⁴ This arrangement was apparently not fool-proof with Captain Paddle complaining in April 1861 that the light had been out twice that month.¹⁵⁵ The expense of maintaining the light rose in 1866 to £73 for both a sergeant and private in charge of the light and an additional £6 for the cost of sounding the gong during foggy weather.¹⁵⁶

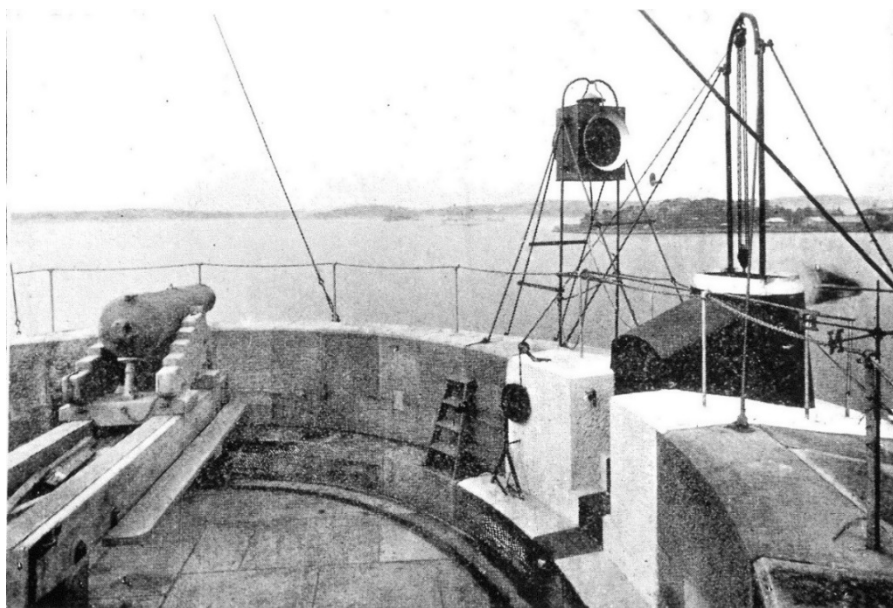


Figure 15 The oil lantern on top of the tower. The 8-inch shell gun appears at left of image (Town and Country Journal 3 Aug. 1910, State Library of NSW, TN83)

¹⁴⁸ *Australian Star*, 7 March 1899, p.6.

¹⁴⁹ *The Riverine Grazier*, 23 May 1899, p.4.

¹⁵⁰ Oppenheim, p.95.

¹⁵¹ 'Evidence tendered in the Water Police Court for divorce proceedings', *Sydney Morning Herald*, 10 July 1872, p.2.

¹⁵² 'Reported in the Legislative Assembly', *Sydney Morning Herald*, 6 March 1874, p.2.

¹⁵³ *Sydney Morning Herald*, 10 May 1858, p.10.

¹⁵⁴ *Sydney Morning Herald*, 12 November 1858, p.5.

¹⁵⁵ *Sydney Morning Herald*, 1 November 1861, p.1.

¹⁵⁶ Legislative Assembly approved estimates in *Sydney Morning Herald*, 30 November 1866, p.3.

Thomas Wren was appointed lightkeeper in the 1870s and he lived on the fort with his wife and two children (**Figure 16**). Wren's daughter Harriet married on the fort in 1879,¹⁵⁷ his grand-daughter was born there later that year¹⁵⁸ and his wife Mary Ann died there in 1880.¹⁵⁹ Wren died on the fort in 1885 aged 64.¹⁶⁰



Figure 16 Fort Denison lightkeeper Thomas Wren and family (NPWS Fort Denison Collection)

Wren's successor Daniel Maley, then employed by the Marine Board Department, retired in November 1895.¹⁶¹

An 1865 calendar of high tide times at Fort Denison was printed in a newspaper for the first time on 31 December 1864¹⁶² and in February 1866 a self-registering Smalleys tide gauge was established at the fort.¹⁶³ The Smalleys was replaced with a Russels gauge in 1872. The tide gauge was also effective in recording the impact of earthquakes. In May 1877 an earthquake in what is today Chile triggered a tsunami which produced a series of tidal waves on the east coast of Australia, the first at 5.20am, which was recorded on the Fort Denison tide gauge as reaching three feet six inches.¹⁶⁴

In April 1866, a column from the old Sydney post office was erected at Bradleys Head exactly 6064 feet six inches, one nautical mile, from the centre of the tower of Fort Denison. It was erected so that steamers could test their rate of speed between the two objects,¹⁶⁵ a knot being one nautical mile per hour.

The 19th century came to a close on Fort Denison with one last bang. In the early hours of 6 October 1900, a man engaged a boatman to row him to Fort Denison and asked him to wait, while the man

¹⁵⁷ *Sydney Morning Herald*, 4 March 1879, p.1.

¹⁵⁸ *Sydney Morning Herald*, 17 January 1880, p.1.

¹⁵⁹ *Sydney Morning Herald*, 23 November 1880, p.1.

¹⁶⁰ *Sydney Morning Herald*, 20 June 1885, p.1.

¹⁶¹ *Evening News*, 16 November 1895, p.7.

¹⁶² *Sydney Mail*, 31 December 1864, p.7.

¹⁶³ *Sydney Morning Herald*, 22 February 1866, p.8.

¹⁶⁴ *Evening News*, 12 May 1877.

¹⁶⁵ *Sydney Morning Herald*, 21 April 1866, p.8.

scaled up the lightning rod to the top of the tower. After a time, the man returned and while they were heading back to the shore there was a flash from the tower. The man had raised a home-made Boer flag, loaded the tower gun with powder and lit a long fuse. The shock was supposed to have shattered several windows in the tower but the lightkeeper, the island's sole occupant, did not pay the shot any heed, as he was used to ships' saluting guns during the night. Police were of the opinion it was a practical joke, possibly by a British 'blue-jacket'.¹⁶⁶ Their hunch was correct. The culprit was Charles Herbert Lightoller, fourth officer on board the White Star Line SS *Medic*. Noting the patriotic fervour of the Australians for the support of the British during the current Boer War, Lightoller had flown the Boer flag as a 'real roaring red rag to the Australian bull'.¹⁶⁷ The only inconsistency between Lightoller's account and the newspaper reports was that Lightoller claimed that he and two midshipmen had planned and executed the raid using a 'commandeered' boat. Lightoller went on to have a notable career, including being the most senior officer to survive the *Titanic* disaster, sinking a German U-boat in World War I and rescuing 130 servicemen from the beaches of Dunkirk in his personal motor yacht during World War II.¹⁶⁸

2.6 Fort Denison in the 20th century

Two days into the 20th century 30 prominent men inspected Fort Denison in response to a proposal by the NSW Minister for Works Edward O'Sullivan to erect a colossal statue of liberty on the island, complete with an electric light in an outstretched hand, to commemorate the foundation of the Commonwealth.¹⁶⁹ The monument was proposed to be called 'Australian facing the dawn'. There was considerable opposition to the proposal with one newspaper stating that the destruction of Fort Denison would be an act of vandalism and the £70,000 would be better applied to some useful public work.¹⁷⁰ Towards the end of World War I the concept was re-floated as a war memorial and the idea continued to re-surface in the local newspapers as late as 1928.¹⁷¹

2.6.1 The Sydney Harbour Trust

The Sydney Harbour Trust began operations on 1 November 1900 with responsibility for the management and improvement of the port. Government-owned foreshore lands, lighthouses and vessels were transferred to or acquired by the Trust. It was not until April 1903 that Fort Denison was also vested in the names of the Sydney Harbour Trust Commissioners with a value of £3000.¹⁷²

The Harbour Trust managed and improved the fort's essential navigational roles. A timber wharf was installed in 1901 replacing the double flight of stone steps.¹⁷³ In 1905 the oil light was replaced with an electric light supplied via a submarine cable, and the fog gong was replaced with a signal bell.¹⁷⁴ Francis Cobb, originally appointed as Officer in Charge of the Light in 1901, was promoted to lighthouse keeper in 1907.¹⁷⁵ In 1905 it was decided the fort would become a saluting battery for the city and the location of the one o'clock gun, with the Royal Australian Artillery charged with transferring and mounting the guns.¹⁷⁶ In late 1907 South Head was deemed a more suitable

¹⁶⁶ *Sunday Times*, 14 October 1900, p.8; *Clarence and Richmond Examiner*, 16 October 1900, p.4; and *Newcastle Morning Herald and Miner's Advocate*, 16 October 1900, p.3.

¹⁶⁷ Charles Herbert Lightoller, *Titanic and Other Ships*, 1935, chapter 27–28.

¹⁶⁸ https://en.wikipedia.org/wiki/Charles_Lightoller, accessed, 1 September 2017.

¹⁶⁹ *Sydney Morning Herald*, 4 January 1901, p.6.

¹⁷⁰ *Sydney Mail and New South Wales Advertiser*, 19 January 1901, p.138.

¹⁷¹ *The Sun*, 12 October 1928, p.13.

¹⁷² *Government Gazette*, 21 April 1903, p.3026.

¹⁷³ Kerr 1986, p.41.

¹⁷⁴ *Government Gazette*, 2 June 1905.

¹⁷⁵ *Government Gazette*, 23 January 1907, p.345.

¹⁷⁶ *Sydney Mail and New South Wales Advertiser*, 1 November 1905, p.1104.

location for the saluting battery¹⁷⁷, but the fort had one last reprise in this role during the arrival of the American Great White Fleet in 1908.

In 1910 part of the fort was found to have become undermined and large blocks were removed with a crane to avoid collapse.¹⁷⁸ The north-western room appears to have been largely demolished at that time. A subsequent diver's inspection on the north-western side found no serious subsidence, the room was rebuilt, and a Harrison's tide gauge was installed in the room.¹⁷⁹ In the same year, to address the repeated electric submarine cable breakages, work also started on replacing the electric light with a more powerful Chance Brothers acetylene gas light in a tower with an electric bell. The 8-inch gun and traversing carriage were craned down to the bastion (**Figure 17**) and the new light was operational by 1913 (**Figure 18**). During the 1920s the light was converted back to electricity and powered initially by a submarine cable and then by a generator located on the island.¹⁸⁰



Figure 17 The 8-inch shell gun with original traversing carriage emplaced in the bastion. The brass howitzers, including the one o'clock gun, are on original garrison carriages (Australian Screensound 1936)

¹⁷⁷ *Evening News*, 30 November 1907, p.1.

¹⁷⁸ *The Star*, 10 June 1910, p.5.

¹⁷⁹ *The Star*, 10 June 1910, p.5.

¹⁸⁰ Kerr 1986, p.44.



Figure 18 Fort Denison after 1915, showing the new light, reconstructed Tide Gauge Room and the new wharf (State Library of NSW, Star Photo a_089117u)

A boat slipway and yard with an ornamental parapet and embrasure for the one o'clock gun (**Figure 19**) and two water tanks were added to the southern end of the Island in 1917–18 (**Figure 20**). Garden beds were under development in 1910 and more elaborate garden beds were added to the courtyard in 1923¹⁸¹ as caretakers modified the fort to create a more domestic lifestyle.



Figure 19 The one o'clock gun, still on its original garrison carriage and standing atop remains of an old 32-pounder gun carriage (National Library of Australia, 'Man operating a canon [sic] at Fort Denison on Pinchgut Island', Sydney, ca 1930s, obj-162997492)

¹⁸¹ Kerr 1986, pp.42–43.



Figure 20 Fort Denison after 1917, showing the boat slip and yard, water tanks and one o'clock gun in the embrasure to the left of image (State Library of NSW, Government Printing Office, d_19107)

Alfred Briggs replaced Frank Cobb as caretaker and was living on the fort with his wife and five children by 1921 when his son Stanley Denison Briggs was born there.¹⁸² William Charles Sumner took up residence as caretaker with his family from 1922 until 1942, with brother James serving as assistant caretaker until 1937.¹⁸³ His brother-in-law also served as a caretaker and was admitted to hospital in 1935 after he was hit in the head with a spade by Sumner after an altercation. Sumner was arrested but later discharged at the Central Police Court after Wilkinson said he didn't wish for the case to proceed as it was really his own fault.¹⁸⁴

During the first four decades of the 20th century Fort Denison was commonly used as a stage for fireworks and illuminations and was an excellent vantage point to welcome visiting dignitaries (**Figure 21**). Fort Denison was already being visited regularly by groups on organised trips such as the Royal Australian Historical Society when regular tours were introduced in January 1936.¹⁸⁵ The one o'clock gun was also made more accessible to the people of New South Wales with a recording of the gun being played on radio stations across the state including in Newcastle, Goulburn and Gunnedah.¹⁸⁶

¹⁸² *The Sun*, 16 July 1922, p.13.

¹⁸³ Mark Shelley Clark and Jack Clark, *The Islands of Sydney Harbour*, Kangaroo Press, 2000, p.83.

¹⁸⁴ *Sydney Morning Herald*, 4 December 1935, p.10.

¹⁸⁵ *The Sun*, 12 January 1936, p.13.

¹⁸⁶ *Goulburn Evening Penny Post*, 14 March 1934, p.3.

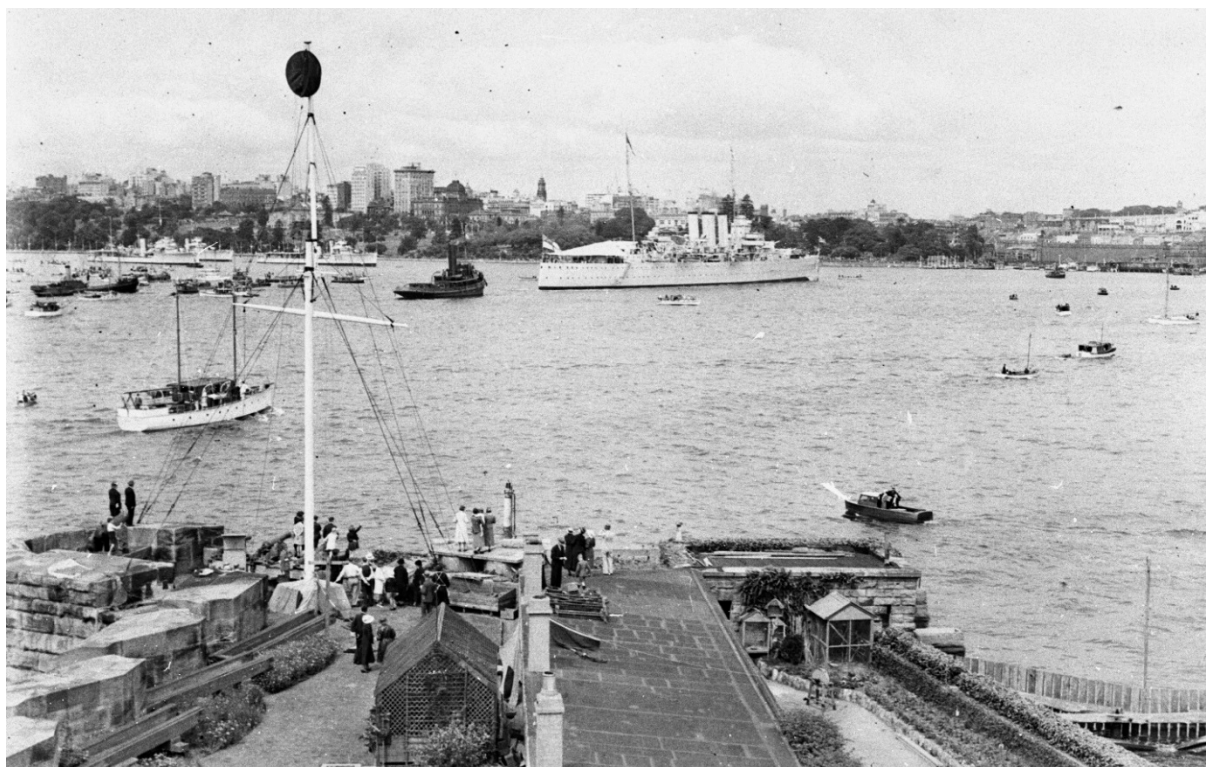


Figure 21 Fort Denison in 1934 during the arrival of the Duke of Gloucester on HMS *Sussex* (Sam Hood, State Library of NSW, 05656u)

2.6.2 Maritime Services Board of New South Wales

The Maritime Services Board of New South Wales (MSB) was created in 1936 subsuming the functions of the Sydney Harbour Trust and taking over management responsibility for Fort Denison. In 1936 the barracks roof was found to be in disrepair and covered with a bitumen product¹⁸⁷ similar to that already installed in 1934.

The fort was occupied by the army during World War II for use as an anti-aircraft battery, with an officer and 30 men in the barracks.¹⁸⁸ A QF 3-inch 20 cwt anti-aircraft gun was mounted in the bastion on a new large concrete pad which may also have enabled it to be depressed en-barbette to serve in an anti-shipping role. Developed during World War I the 3-inch gun was the standard AA-gun in use by the British until the mid-1930s. Australia commenced production of the gun in 1937 using machinery purchased from Britain, by which time Britain was replacing the 3-inch gun with a superior 3.7-inch gun.¹⁸⁹ The army was already in occupation by November 1941 when Bombardier Alan Ward was reported as having just recommenced duties on the island.¹⁹⁰ Sandbagging and a lavatory block in the slip yard area were added.¹⁹¹ The firing of the one o'clock gun was halted in February 1942 for security reasons.¹⁹²

Fort Denison was hit by a shell during enemy action in 1942 albeit an example of 'friendly fire'. On the night of 31 May 1942, the Imperial Japanese Navy launched an attack on allied warships using three midget submarines launched from mother-submarines off-shore. At around 11pm, the night watch crew of the heavy cruiser USS *Chicago* caught one of the submarines in its searchlight beam

¹⁸⁷ *Sydney Morning Herald*, 21 July 1936, p.14.

¹⁸⁸ Kerr 1986, p.39

¹⁸⁹ http://artilleryhistory.org/artillery_register/nsw/gun_manly_qf_3inch_anti_aircraft_gun_sn4282.html, accessed 6 September 2017.

¹⁹⁰ *Northern Star*, 24 November 1941, p.2

¹⁹¹ Kerr 1986, p.41.

¹⁹² *Sydney Morning Herald*, 12 November 1945, p.6.

and a 5-inch gun crew and quad mount machine gun both opened fire raking the area towards Fort Denison¹⁹³. One of the 5-inch shells hit the Martello tower causing minor cracking only.¹⁹⁴

The army vacated the island in April 1943 and the MSB removed the army's temporary additions and carried out repairs, returning the fort to its 1920s appearance (**Figure 22**).



Figure 22 Fort Denison, 1948 (Government Printing Office, State Library of NSW, d1_20837)

Jack Parnell was caretaker from 1943¹⁹⁵, Jack Harlow was the caretaker in 1947 and Osmond Jarvis from 1951 to 1954. Jarvis's responsibilities included reporting the 9am tide level daily to the Observatory, constant sweeping of the tower, mowing the lawns, generally keeping the site clean and taking visitors on tours of the fort, while Mrs Jarvis made scones on the fuel stove and cups of tea for the visitors. At that time electricity was provided by 54 batteries stored in the Battery Room and charged by a Ruxton diesel generator.¹⁹⁶

'Restoration' work was carried out in the 1950s, including reconstruction of deteriorated stonework, particularly the window surrounds and removal of all surviving iron shutters and most doors and many of the iron fixings which supported them. It is probable that most of the original interior Board of Ordnance fittings were removed at that time, including the iron skirtings, fireplace grates and surrounds.¹⁹⁷ In 1958 the British movie *Siege of Pinchgut* was filmed on the island. It was the last movie made by Ealing Studios and while not a box office hit it has historical value, depicting post-war Sydney and the 1902 Fort Macquarie Tram Shed which was being demolished to make way for the Sydney Opera House.¹⁹⁸

¹⁹³ David Jenkins, *Battle Surface*, Random House, 1992, pp.210–211.

¹⁹⁴ Kerr 1986, p.39.

¹⁹⁵ Clark & Clark, p.83.

¹⁹⁶ Wesley Jarvis, May 2008.

¹⁹⁷ Kerr 1986, p.41.

¹⁹⁸ https://en.wikipedia.org/wiki/The_Siege_of_Pinchgut, accessed 6 September 2017.

Cliff Morris replaced caretaker Staff Adams in 1961 and was the longest serving caretaker, living on the fort for 25 years with his wife June and two daughters. The caretaker's residence was equipped with a wood stove, kerosene fridge and a fuel copper for washing¹⁹⁹, little more than that experienced by the artillery gunners during the previous 100 years. Cliff was responsible for leading the guided tours, changing the tide gauge chart (**Figure 23**), attending to the light and undertaking maintenance, while June served tea and cakes, baked in the wood stove, to the island's visitors to make some extra money. In 1961 guided tours were being run on Tuesdays, Wednesdays, Thursday and Fridays. In 1963 nearly 5000 people visited the island on guided tours²⁰⁰ and by 1964 this number had grown to about 13,000.

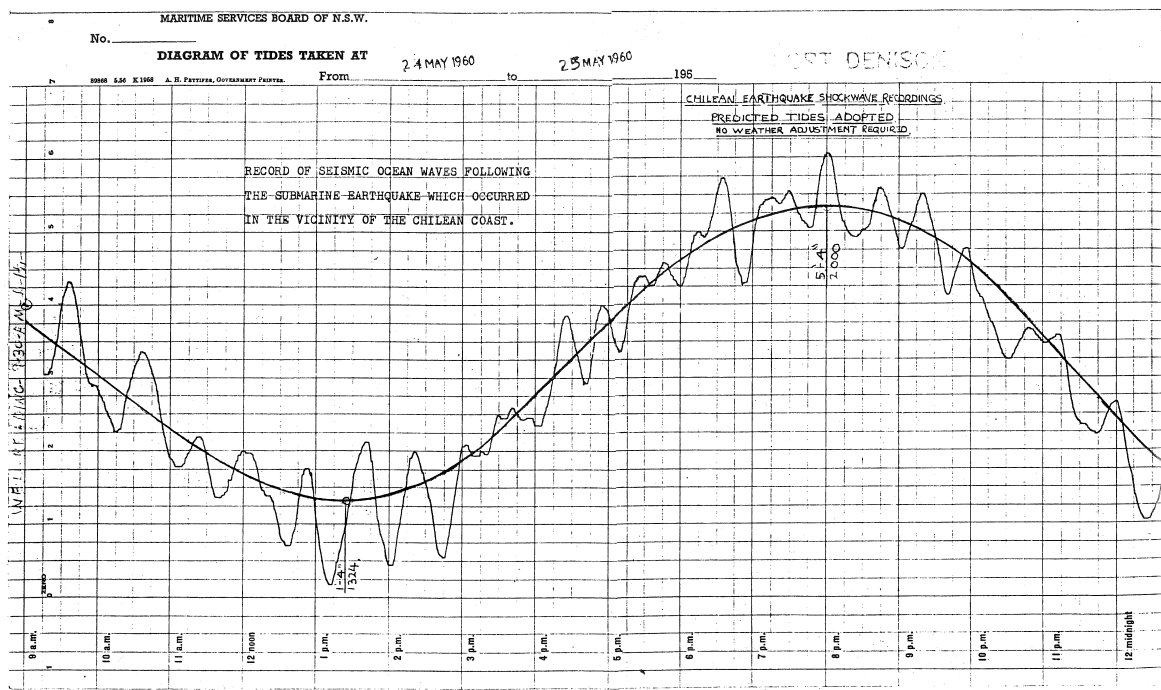


Figure 23 Tide chart showing effect of earthquake, May 1960 (OEH 2018)

The 32-pounder gun carriages were still present on the fort in early 1964 (**Figure 24**) but were probably removed when the 8-inch shell gun was removed from the island for reconstruction of the 32-pounder gun carriage on which it had been mounted. The gun carriage was reconstructed using ironbark, a cheaper alternative to the original teak.²⁰¹

¹⁹⁹ June Morris, *Where Convicts Never Stepped*, 1998, p.1.

²⁰⁰ Morris, p.19.

²⁰¹ *Australian Women's Weekly*, 9 December 1964.



Figure 24 32-pdr gun carriages, 1964 (Government Printing Office, State Library of NSW, d1_10091)

The caretaker's kitchen, bathroom and laundry and public toilets were all refurbished in 1967 improving what was otherwise relatively basic living conditions and asphalt laid in the courtyard in 1968.²⁰² In 1970 a submarine electricity cable was laid from Garden Island to the fort and the fort was no longer reliant on a generator and batteries. The fort was flood-lit for the first time and the kitchen was fitted with electrical appliances and a hot water system. Tours were increased to three a day on weekdays and four a day on Saturdays, and June was instructed to cease serving refreshments. The interior of the tower was painted in 1971.²⁰³ The stone wall and gate separating the slipway from the slip yard was constructed in 1984 by the Public Works Department. New stone facades were indented into degraded window sills and the malthoid and tar roof covering on the barracks was replaced.²⁰⁴

Visitation continued to increase from 16,000 in 1971²⁰⁵ to nearly 23,000 visitors in 1985.²⁰⁶ As early as 1974 consideration was being given to providing new visitor uses on the island including an outdoor café and restaurant²⁰⁷ and concept plans were prepared for a removable canopy for special events on the terrace (**Figure 25**).

²⁰² Morris, pp.45–6.

²⁰³ Morris, p.68.

²⁰⁴ Morris, p.126.

²⁰⁵ Morris, p. 68.

²⁰⁶ Kerr 1986, p.39.

²⁰⁷ Morris, p.90.



Figure 25 Pre-1992 proposal for a removable canopy for special events (NPWS Collection undated)

Norm Dow was the last MSB caretaker and lived on the fort from 1986 to 1992. In the late 1980s, the MSB began the process of streamlining the Board and divesting it of non-core assets deemed surplus to requirements. Fort Denison was one of the assets identified for removal from its portfolio.²⁰⁸ Fort Denison was transferred to the NSW National Parks and Wildlife Service in 1992 and in the following year it was gazetted as part of Sydney Harbour National Park.

2.6.3 NSW National Parks and Wildlife Service

NPWS continued to manage Fort Denison as a heritage tourist site with regular guided tours for most of the year. Visitor numbers continued to increase with 20,500 visitors in 1992–93, 26,384 visitors in 1993–94 and 28,227 visitors in 1994–95. The island was also made available for events and functions, including access to watch the annual New Year's Eve fireworks spectacular.

A stonework repair and conservation program was undertaken, the light tower was temporarily removed for restoration and the island was connected to mainland sewer infrastructure by means of a submarine connection.

Architects Tzannes and Associates were commissioned by NPWS in the late 1990s to design and document works necessary to adaptively reuse the former caretaker's residence as a café/restaurant. These works included the construction of a commercial kitchen and dining room, new amenities, interpretative displays and a function marquee, reconstruction of the terrace, new lighting and electrical services and conservation of the timber, stone and metal fabric of the building.²⁰⁹ The works were completed in 2000, winning the Royal Australian Institute of Architects Award for conservation and a National Trust Heritage Award for a Café and Interactive Area in 2001. The café/restaurant and courtyard were subsequently leased to a private operator for operation of a café/restaurant, events and functions. A Vetal acoustic sensor was installed in 1996 providing digital one-minute tide records.²¹⁰

²⁰⁸ OEH, *Goat Island: A Contextual History*, 2011, p.159.

²⁰⁹ <http://tzannes.com.au/projects/fort-denison>, accessed 13 February 2018.

²¹⁰ *Tide Gauge Histories*, Manly Hydraulics Laboratory, October 2013, p.12.

2.7 Fort Denison in the 21st century

In 2007 the Government Architect's Office was commissioned to undertake a program of stone conservation works. The Stonework Strategy prepared in 2008 outlined an initial three-year program of 'catch-up' maintenance and repair works, intended to be followed by further programs of less urgent repair works and cyclic maintenance works.²¹¹ These works were carried out between 2008 and 2010 and included repairs to the asphalt floor material in the magazine, conservation work to metals, roofing and paint finishes and desalination of stonework using sacrificial renders.²¹² The interpretive exhibition in the barracks building was renewed and moveable heritage items placed on display. The Vetal acoustic sensor was upgraded to a SeaRanger acoustic sensor in 2007.²¹³

To support the restaurant operation, approval was granted by NPWS for the erection of a temporary marquee in the courtyard. In 2009 the marquee was modest in size at around 15 metres long by six metres wide. The marquee was extended to 24 metres long in 2010 and 30 metres long in 2013. With a capacity of 200 diners the marquee presented as an intrusive feature on the fort and impacted on visual appreciation of the fort and circulation around the place (**Figure 26**).



Figure 26 The restaurant marquee (R Newton/OEH 2017)

In 2013 NPWS constructed a covered storage area in the slip yard. In 2015 the 8-inch gun was again craned off the island to allow the gun carriage to be rebuilt utilising a team of NPWS staff and volunteers.

The restaurant lease expired in 2017 and the marquee and kitchen fixtures were removed. In 2018 NPWS commenced repair and conservation work within the barracks building including stone conservation work, joinery repairs and re-painting. Ferry wash on top of abnormally high tides in early 2018 breached the fort's stone walls and was a reminder that going into the future the greatest threat to the fort will not be from enemy attack but from sea level rise.

²¹¹ Government Architect's Office, *Fort Denison Stonework Conservation Strategy*, Report No 07170, April 2008.

²¹² Government Architect's Office, *Stonework Conservation*, Volume 1, 2007–08, Volume 2, 2008–11.

²¹³ *Tide Gauge Histories*, p.12.



Figure 27 Fort Denison in 2017 (Matthew Allan/OEH 2017)

2.8 The fort as part of a cultural landscape

Part of the island's and the fort's recreational role has been its use as an artistic subject. In the early years of settlement and until the fort appeared, the island was treated artistically as just another island in the harbour. As Fort Denison, however, the island was a harbour landmark and it was included in, and the subject of, numerous sketches, paintings, photographs and descriptions. In 1958 it formed the setting and an important part of the storyline of an international film.

As part of the harbour's seascape the small rocky island near Neutral Bay was not worth noting except as part of the harbour. Usually Pinchgut was barely visible in pictures of the harbour from the south or from the north or from one of the other islands. Only occasionally was it a notable part of the image. An unknown artist painted the 'Entrance of Port Jackson, 1797' showing Pinchgut, and it is just possible to see a gibbet. At around the same time the erstwhile master pick-pocket 'George Barrington' included a picture of the island, focusing on its gibbet, in his *History of New South Wales*. These kinds of images were usually sent back to England. They showed Sydney and the surrounding area as a distant and unruly place that was gradually being brought under British control. Another way of looking at this is that the images were one way in which the settlers tried to make a strange place seem less threatening.

By the time the fort was constructed, and for the decades afterwards into the 20th century, the way the harbour, and therefore the fort, was shown in pictures, photographs and film, fitted in with its current use. In the late 19th and early 20th century the fort was depicted as a counterpoint to the large trading vessels that used the harbour's wharves; then as the harbour's role in cargo transportation was shared with rail, road and air the fort became part of a seascape that offered leisure as well as industrial activities. The fort became part of pictures and photographs of sailing ships and small pleasure craft, or part of a view from the shore framed by bushes and trees.

One of Fort Denison's most potent aspects is its romantic and even arcane image. While showing that the fort was a part of the harbour's industrial role, pictures also presented it as mysterious, Gothic, and isolated from the 'real' world (**Figure 28**). Perhaps one of the best examples of this was its use as the scene for the 1958 film *The Siege of Pinchgut*. The storyline gave an ironic twist to the early role of the island as it dealt with an escaping convict who held the fort and its caretakers

hostage. But the fort's imaginative and physical place in the harbour still drew on the need to show that Sydney and its environs were at once unique and familiar:

The tiny island on which Fort Denison stands has always occupied an affectionate place in the regards of those who know and appreciate the scenic attractions of the Port of Sydney, but now, through the agencies of this film, its quaint beauty will, no doubt, arouse the curiosities of those in distant lands. However, the film should do more than that...it is a film about Sydney and to many millions it will provide, for the first time, a realistic impression of this harbourside city of two million inhabitants which is often mistakenly regarded as a far-flung outpost of civilisation.²¹⁴

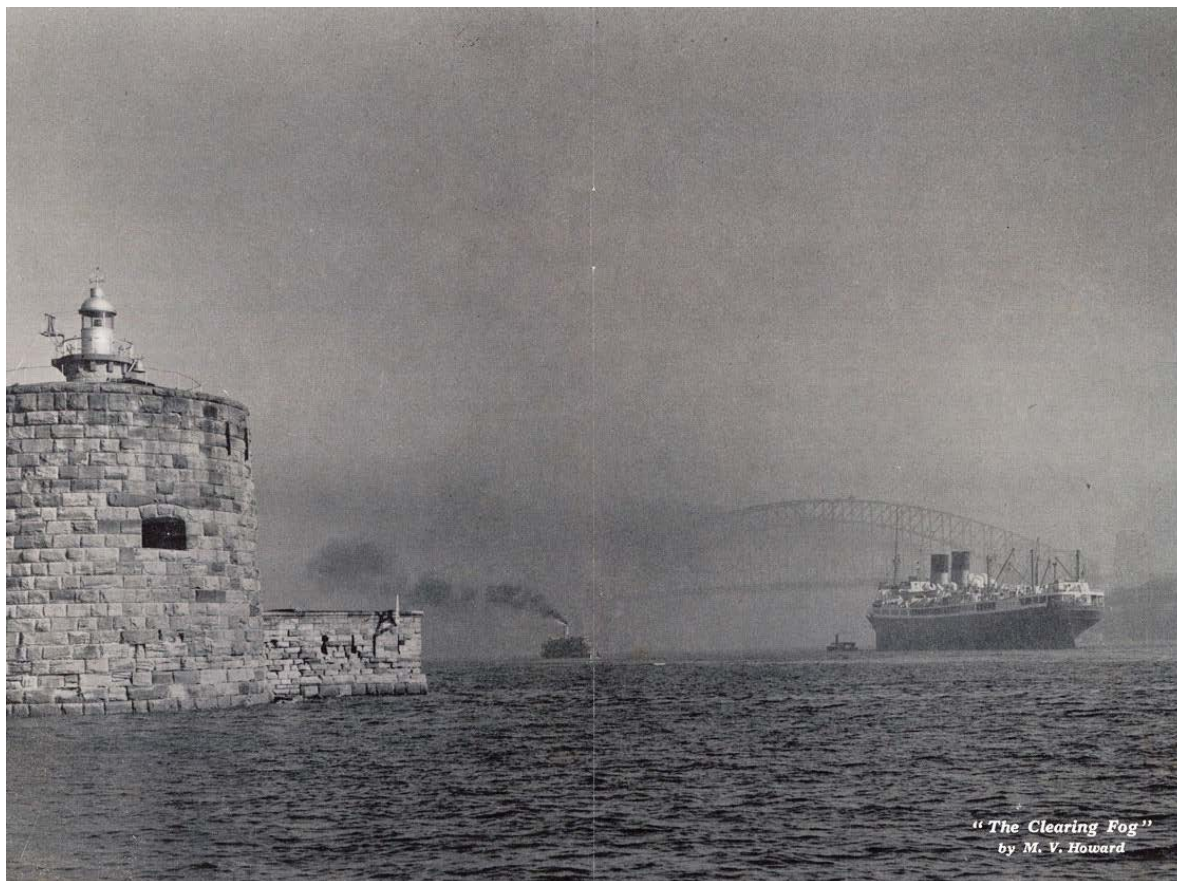


Figure 28: M V Howard, *The Clearing Fog*, centrefold of booklet *Fort Denison, Sydney Harbour*, by A B Shaw (Maritime Services Board undated, c1960s)

2.9 Historical phases and themes

Fort Denison has eight key overlapping historical phases:

- Muddawahnyah, ongoing
- Pinchgut Island, 1788–1840
- Pinchgut Island Battery, 1840–1855
- Defending the Harbour, 1856–1900
- Maritime Uses, 1856–present
- The Caretakers, 1901–1992
- World War II, 1941–1944
- Tourist attraction, 1950s–present.

Table 2 provides a summary of key historical phases and NSW and national historical themes.

²¹⁴ *The Siege of Fort Denison in Port of Sydney*, The Official Publication of the Maritime Services Board of NSW, Volume 6, number 5, December 1958, p.152.

Table 2 Historical phases and themes

Historical phase	Description	Features	NSW historical theme	Australian theme
Muddawahnyah	The island and its landmark values.	The remains of the natural island: bedrock in barracks, tower and battery and the rock shelf.	Environment – naturally evolved	1. Tracing the natural evolution of Australia
	The island and its Aboriginal values.	The island's place-name, use and contact history.	Aboriginal cultures and interactions with other cultures	2. Peopling Australia
Pinchgut Island 1788–1840	A place of convict confinement and punishment and gibbetting.	No remaining physical features of occupation.	Convict Law and Order	2. Peopling Australia 7. Governing
Pinchgut Island Battery 1840–1855	Construction of a gun terreplein using convict iron gang labour.	The remains of the bedrock terreplein in the battery and rear wall of the barracks building.	Convict Defence	2. Peopling Australia 7. Governing
	Use of the site for secondary punishment.	No remaining physical features of occupation.	Convict	2. Peopling Australia
Defending the Harbour 1855–1900	Construction of the fort and defence of Sydney. Occupation by the Royal Artillery. Use of the fort by Royal Artillery, NSW Artillery and NSW Naval Brigade for military training.	The Martello tower, barracks building, battery, bastion, loopholed rifle chambers, the ordnance, moveable heritage items. Place-name.	Defence Domestic life Persons Creative endeavour	7. Governing 8. Developing Australia's cultural life 9. Marking the phases of life
Maritime Uses 1856–present	Use of tower for navigation light, installation of tide gauge, firing of one o'clock gun, occupation by a lightkeeper.	Light tower, Tide Gauge Room and machine, one o'clock gun, moveable heritage items.	Science Transport	3. Developing local, regional and national economies
Caretakers 1900–1992	Occupation of the fort by caretakers of the Sydney Harbour Trust and Maritime Services Board.	Wharf, slipway and slip yard, one surviving room partition, fig tree, palm tree, moveable heritage items.	Domestic life	8. Developing Australia's cultural life

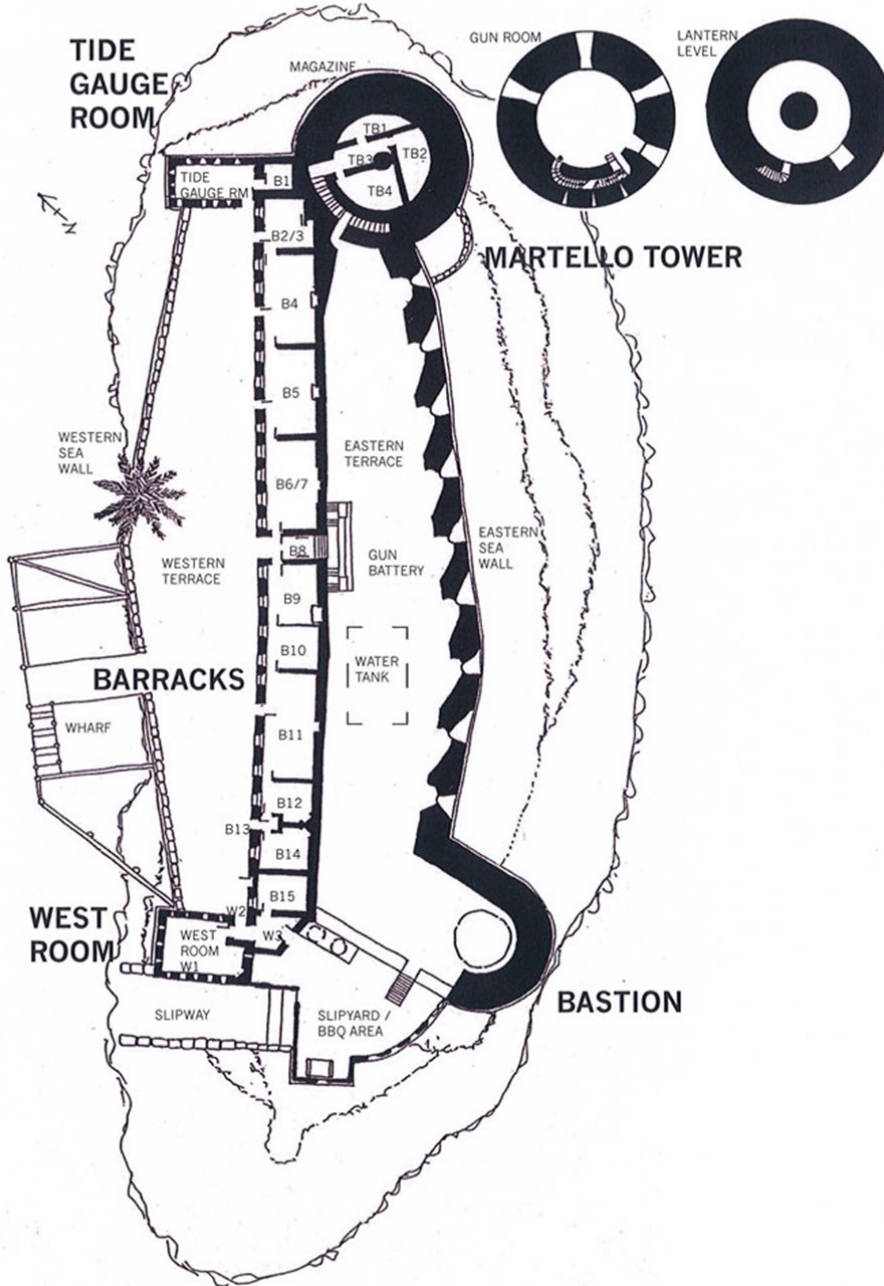
Fort Denison Conservation Management Plan

Historical phase	Description	Features	NSW historical theme	Australian theme
World War II 1941–44	Occupation of the fort by the army to provide anti-aircraft defence.	Concrete base for anti-aircraft gun, evidence of shell damage on tower.	Defence	7. Governing
Tourist attraction 1950s–present	Establishment of formal public access and guided tours.	Public amenities, interpretive displays.	Leisure	8. Developing Australia's cultural life

3 Physical analysis

3.1 Description of physical elements

Analysis of physical fabric was based on visual inspection of in situ evidence with no opening up and analysis of historical research including archival drawings and plans. The physical elements of the fort are identified on **Figure 29**. Each element is described below.



Plan not to scale

Figure 29 Plan of Fort Denison identifying physical elements

3.1.1 The natural island

Until 1840 the island was a largely undisturbed small rocky sandstone island with a sparse covering of vegetation. The quarrying of the island to create an open battery resulted in the removal of all native vegetation and all of the stone down to the level of the parapet. Much of the open battery was subsequently incorporated into the fort's barracks building and battery. Evidence of the island's bedrock remains along the rear internal wall of the barracks building, the battery and the Martello tower.

The island's stone is white, grey and pale yellow in colour and has been categorised as one of the quartz-rich sandstones heavily used in Sydney up until the 1850s. Unlike yellow block sandstone which features prominently in the city's historic buildings post-1850s, the colour of quartz-rich sandstone does not darken or change colour when quarried and exposed to the air. The stone used to construct Fort Denison was sourced from a quarry at Kurraba Point and is the same type of quartz-rich sandstone. This type of sandstone was sourced from numerous quarries in and around Sydney and Sydney Harbour. It can also be found on buildings at Goat Island, Sydney Observatory, St Andrews Cathedral and some buildings at Sydney University.²¹⁵

3.1.2 The Martello tower

The Martello tower was built with an open gun platform (terreplein) which surmounted two internal levels. The top external level (the former terreplein) now holds a central circular brick tower, cement rendered to imitate stone, topped with a sandstone platform supporting a steel and glass navigational light. The bottom internal level contains rooms formerly for the storage of gun powder and provisions, and the middle internal level still houses the three original cannons. Internal tower circulation is via a spiralling staircase that connects the three tower levels. External access to the tower is through a single external timber door from the upper terrace level (the former battery). The tower is cut into the bedrock at its lowest levels with sandstone walls above, rock-faced externally, with granite joggles connecting the sandstone blocks. Both the bottom level rooms and the middle level single room have sandstone vaulted ceilings. Internal doors are of heavy timber construction with cast-iron hinges, and windows to the middle level are multi-paned and timber-framed.

3.1.3 The battery and the bastion

The outward facing defensive side of the fort, known as the gun battery and bastion, confronted incoming ships. It is constructed from the island's sandstone bedrock. The battery consists of an open working area which services a series of nine-gun placements and corresponding slanted firing openings which are equally positioned along the raised sandstone parapet wall of the battery, formed of very large blocks connected both horizontally and vertically with granite joggles. The surface of the battery is now grassed, and there is an elderly fig tree towards the northern end. An underground water tank has been cut into the bedrock of the battery. The bastion located at the southern end of the battery was constructed to mount a single cannon set behind a raised stone parapet, and is of similar construction to the Martello tower and battery parapet. It now has a raised concrete circular gun mount in the centre of concrete paving.

3.1.4 The barracks

The main single-storey building is the barracks. The barracks are partly cut back into the bedrock and built with sandstone walls. They contain a single row of rooms originally used

²¹⁵ Dr Brenda Franklin, *Stone: The role of petrography in the selection of sandstone for repair*, presented to the Heritage Office Seminar on Material Evidence, April 13-14, 2000, pp 3-5.

for military accommodation, bunk-style for the lower ranks and separate rooms for officers' quarters. A central breezeway and vault covered staircase allow access from the barracks and lower terrace to the upper level battery, bastion and Martello tower. The barracks block is roofed with a series of sandstone barrel vaults supported by iron beams, with a timber-framed bituminous membrane sloping roof above. Doors and windows are timber-framed and were originally protected externally by iron shutters. The internal joinery in the officers' quarters is more elaborate than that of the rooms for the lower ranks.

The visual impact of the fort is a combination of the strong vertical mass of the Martello tower and the equally strong horizontal lines of the low barracks building and battery. The two distinct building forms reflect the history of the staged fort construction; which progressed from the original horizontal form of the battery to the later construction of the barracks and Martello tower.

3.1.5 The Tide Gauge Room and the West Room

The two end rooms adjoining the barracks, known as the Tide Gauge Room to the north and the West Room to the south, were constructed soon after the completion of the barracks. They served as both defensive positions and additional accommodation. The loopholes (angled openings) were designed to enable defensive small arms fire against enemy attack. Both rooms were constructed with sandstone walls and membrane roofs like those of the barracks, but without the stone vaulted ceilings internally; the Tide Gauge Room has a boarded ceiling and the West Room a modern plasterboard ceiling.

3.1.6 The terrace

The lower north-west facing terrace is constructed on the same level as the barracks. It was built on rubble fill which is contained by a low stone seawall. The terrace is open and not defensive in nature, as it faces away from the open sea and potential attack. It currently has a bitumen surface and a single garden bed containing a palm tree. Several garden beds were previously constructed on this terrace during the 20th century as part of the domestication of the fort by the Sydney Harbour Trust and later Maritime Services Board caretakers.

3.1.7 The wet ditch

A wet ditch (like a moat) and the remains of a breakwater formed by sandstone blocks separate the fort from the open harbour channel on the south-eastern side. Beyond this is a rubble ballast breakwater which surrounds the whole island and moderates the wave action against the stone fabric of the fort.

3.1.8 The slipway

The slipway to the south-west of the West Room consists of parallel sandstone walls extending into the harbour, with a concrete platform at the inner end. The base of the slipway now consists of stone rubble, the former boat slips having been removed.

3.1.9 The slip yard

Behind the slipway is the slip yard, an area enclosed by low stone walls along the outer edge, with timber steps leading to the battery. A stone embrasure at the south-western end currently houses a disused barbecue. Most of the slip yard is occupied by a modern single-storey timber-framed storage shelter with a flat roof.

3.1.10 The wharf

The present wharf consists of a line of timber piles along the north-western side of the island, braced against the seawall by timber shores, and supporting a set of timber steps connected to the terrace by a timber bridge edged with a picket fence.

3.2 History of alteration to fabric

Fort Denison retains a remarkable degree of integrity in its completed form. The reasons for this degree of integrity include an early recognition of its landmark features, isolation, functional design utilising solid sandstone construction, ongoing use for navigational purposes, ongoing government control, public interest in the history of the site and long held regard as an historic landmark.

Most of the changes to its fabric have occurred progressively over the past 150 years and have been of a minor nature; either through the upgrading of navigational and services technology, provision of caretaker accommodation, the introduction of visitor facilities or repairs to deteriorated elements. Documented below are the most important changes to the key spatial areas, identified from comparison with historical plans, photographs and physical evidence. The most useful historical plans used were;

- an 1856-57 War Office plan of battery, tower and barrack under construction on Pinchgut redrawn by Kerr
- a Sydney Harbour Trust plan, undated but before 1915
- a 1923 Sydney Harbour Trust plan of Fort Denison with section through the tower, with corrections and additions made after a 1986 inspection
- a 1944 MSB plan of Fort Denison
- an MSB plan of Fort Denison, c1970s.

3.2.1 The Martello tower

The Martello tower was constructed from 1856 to 1858 (**Figure 11**). The tower is largely intact externally and internally, except for the removal of the gun from the terreplein in 1913 and construction of the light tower and mounted navigation aid. The cut-out step up and fixing points in the stonework in the south side of the tower parapet are evidence of the location of the earlier fixed navigation light, now on display in the barracks building. The purpose of the structure once located at the top of the cut-out stone steps (**Figure 15**) remains unknown. Framed glazed windows have been fitted to the middle level. The 32-pounder guns have been painted in several colours in past years including white and black. The interior of the tower was painted in 1971. Storage of display cases and wine barrels (simulating powder barrels) on the bottom level has permanently marked the Seysell asphalt floor surface.

Externally, the sandstone retaining wall on the south side of the tower, which encloses a small grassed area below the level of the battery, seems to have been added about the time the Tide Gauge Room was rebuilt in 1910. It is shown on the 1923 plan (redrawn by Kerr in 1986) as 'Ficus bed'. A similar wall enclosing a ficus bed behind the West Room, shown on plans up to the 1970s, appears to have been removed when a substation was installed, probably sometime between 1986 and 1992.

3.2.2 Barracks

Most alteration has occurred in the northern rooms of the barracks, initially during conversion to a residence by the Sydney Harbour Trust and subsequently during adaptation for

commercial kitchen and dining areas. Alterations occurred initially under the ownership of the Sydney Harbour Trust from 1901 to 1936. Minor alterations and upgrading works continued under management by the Maritime Services Board from 1936 to 1992. There were further alterations in 2000 which adapted the former caretaker's kitchen, laundry and bathroom as a commercial kitchen.

The original barrack rooms were not connected internally, and doors opened directly to the terrace or to the battery entrance passage. Door openings were created between all internal spaces before 1923, allowing internal circulation through the barracks, most likely to facilitate its use as a caretaker's residence. The later openings have full length stone lintels with steel lintels above them, the steel serving either as a relieving lintel or possibly as lost temporary work, inserted to support the stone above while the opening was made below.

The Board of Ordnance cast-iron skirtings have all been removed, as have most of the external iron shutters, although many of the iron mountings remain. Sandstone indents have been introduced into the west facing elevation. Internally some of the original face sandstone wall surfaces have been cement rendered, possibly as an aesthetic improvement for residential accommodation or as a superficial treatment to repair deteriorating stone surfaces. The officers' quarters, however, appear to have been finished originally with plastered walls. Most of the interiors are currently painted and are likely to have been whitewashed either originally or from an early period, to improve lighting.

Repairs in 1984 by the Maritime Services Board included indents to degraded window sills, and replacement of the malthoid and tar roof covering on the barracks. The roof membrane was replaced again by NPWS in 1997, as part of an extensive program of works that began in 1996. This work later included the replacement of one of the original chimneys which had been demolished in a storm that also destroyed a marquee erected on the terrace (**Figure 30**). The chimneys had originally been fitted with pots, which had mostly disappeared by the 1990s; as part of the repairs all chimneys were fitted with brass vent boxes. In 2000, the chimney above the commercial kitchen was rebuilt to take the new kitchen exhaust (**Figure 31**).



Figure 30 Storm damaged marquee (left) and detail of missing chimney demolished by the same storm (NPWS 1996)

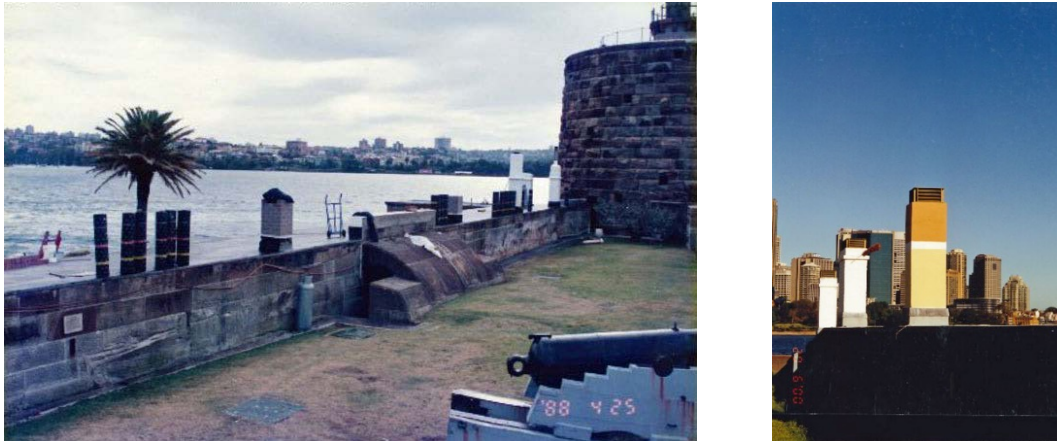


Figure 31 Installation of new membrane roof showing rebuilt chimney, 1997 (left) and detail of rebuilt chimney for kitchen exhaust, 2000 (NPWS 1997 and 2000)

Other internal repairs to the barracks at this time included the removal of cement render from walls in several rooms. Following render removal, a number of walls were treated with sacrificial render to draw out salts that had collected behind the cement render.

Progress photographs taken at the time show that all timber floorboards in the barracks room were removed to inspect the subfloor structure (**Figure 32**). It is evident that sound original wide boards were subsequently re-laid in Rooms B5 and B6. Some of these boards were pit-sawn while others were circular sawn (**Figure 33**), although both could be original to the building, as circular sawn boards were available from the 1840s. As part of the replacement work, brass ventilation grilles were installed along the walls of these rooms to improve subfloor ventilation, with protective brass railings in front of them (**Figure 44**). The original subfloor vents through the north-west wall had copper flues and wire mesh grilles installed. Floorboards in Rooms B9 to B12 were also partly removed and replaced in the late 1990s; these are narrower boards which probably date from the 20th century. Interestingly, the boards in Rooms B11 and B12 are laid across the room (north-west to south-east), whereas all other timber floors have the boards running parallel to the long walls of the barracks.



Figure 32 Floor structure in Room B6/B7 after removal of floorboards (NPWS 1997)



Figure 33 Underside of floorboards from access hatch in Room B6/B7, showing pit-sawn board below and circular sawn board above (Orwell & Peter Phillips 2018)

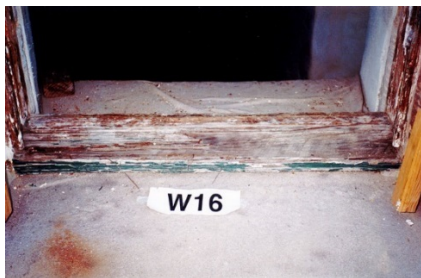
The window and door joinery of the barracks was extensively repaired by Heath Larke over a 14-month period in 1998–99 (**Figure 34**). Window sashes were taken out, window glass removed, and sashes stripped of paint and patched, then reglazed with new glass, painted and reinstalled. Weathered sections of window sills were cut away and new timber pieces fitted over the remaining sill. Door leaves were similarly taken down, boarded linings removed, and both frames and linings patched and reassembled. Rotted sections of door frames and jamb linings were also patched before the repaired doors were rehung on new hinges.



(a) Window sash removed



(b) Window sash patched



(c) External window sill



(d) Window sill patched



(e) Door removed



(f) Door jamb with new base ready to splice



(g) Door frame patched



(h) Door boards patched

Figure 34 Photographs of joinery repairs 1998–99 (Heath Larke)

Room B1: The 1856 plan notes the use of this space as a privy. On the 1923 plan it is noted as the fort's only WC. The opening to Room B2 was created between 1856 and 1923, most likely following acquisition by the Sydney Harbour Trust and conversion to a residence, and was closed again before 1944 when the room was still identified as a lavatory (**Figure 35**). It was possibly converted to a male visitors' toilet during the 1960s when the island operated as a tourist attraction. The existing floor is concrete, although it was presumably originally timber. It was refitted in the 1980s by the MSB, most likely at the same time as the Tide Gauge Room (around 1983) and reconfigured as a wheelchair accessible toilet by NPWS in the late 1990s.

Rooms B2 and B3: These two rooms were initially constructed as the gunners' kitchen, with three boilers for cooking, washing and laundering. A cast-iron horizontal flue stamped with the Board of Ordnance mark, probably forming part of the steam apparatus for the boilers, was chased into the south-east wall, and revealed when render was removed in the 1990s (**Figures 35 and 36**). The room also contained a fireplace, probably a large kitchen hearth on the south-west wall; the flue within the stone wall and the chimney above survive, although the fireplace and chimneybreast have been removed and the wall patched with brickwork through various alterations beginning with the insertion of the door to Room B4 probably in the early 20th century. Holes at the top of this wall may also have been part of the boiler flue system discharging into the chimney above. An original framed and braced (boarded) timber door (repaired in the 1990s) provides access to the terrace, with a later ledged and braced door and timber lined opening leading to Room B4. Original 12-pane double hung sash windows (repaired in the 1990s) and a small iron hatch and door located on the south-east wall also survive from the fortification period.

The former kitchen was shown on the 1923 plan to be used for a new laundry, and it may be that the sandstone walls were rendered and the timber floor replaced with concrete at this time. The room was divided into a smaller laundry and new bathroom by a timber partition and new internal timber door in 1944 and was still shown as divided by the partition on the 1970s plan. The dividing partition, bathroom and laundry fixtures and fittings were all removed, and the render removed from the walls in late 1997, prior to conversion of the room to a cool-room adjoining a new commercial kitchen. This work, carried out in 2000, included installing a concrete hob and topping to the floor (**Figure 37**), erecting a steel and timber frame (**Figure 37**), and lining the walls, before installing a cool-room and other kitchen equipment. All the equipment and false walls were removed in 2018.



Figure 35 Room B2/B3 looking north (left) showing partition and tiling being removed, and north-east wall (right) after render removal, showing bricked up former doorway (NPWS 1997)

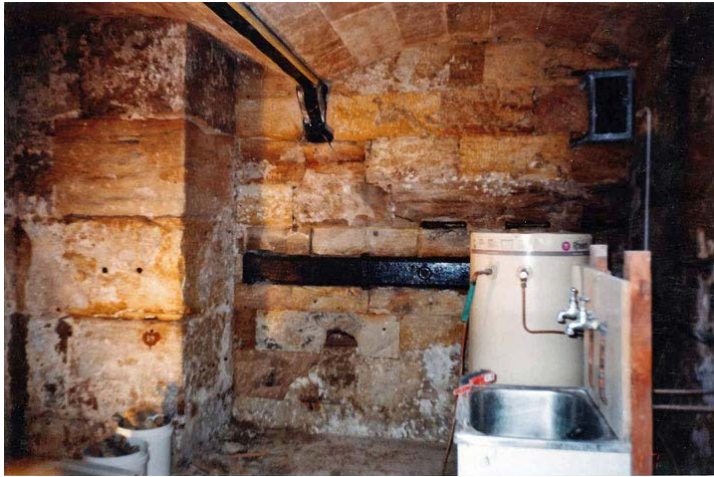


Figure 36 Room B2/B3 looking east (left), following the removal of render in 1997, showing the plumbing manifold embedded in the wall (NPWS 1997), and detail of the Board of Ordnance stamp on the plumbing manifold (right) (Orwell & Peter Phillips 2018)

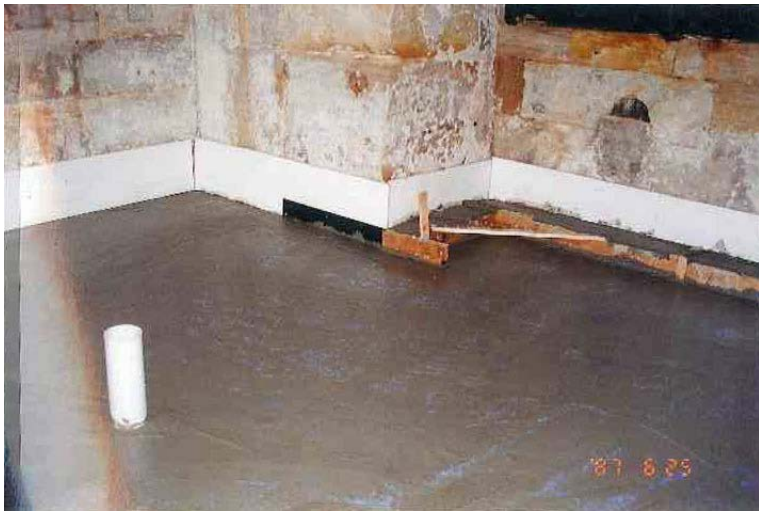


Figure 37 Room B2/B3 looking east, showing newly laid concrete topping and hob (NPWS 1998)



Figure 38 Room B2/B3 looking south-east, showing new framing to walls (NPWS 1998)

Room B4: This room was constructed as one of five almost identical barracks rooms for the enlisted gunners. The room contains original 12-pane double hung sash windows (repaired in the 1990s, with new timber window boards installed over the internal stone sills) and an original external framed and braced timber door to the terrace (also repaired in the 1990s). The internal framed and boarded timber door to Room B5/B6 probably dates from the early 20th century, associated with the Sydney Harbour Trust. The 1923 plan shows the room undivided. The Metters 'Canberra' wood fuelled enamelled cooking range is presumably the one shown on the 1944 plan to be removed from the adjacent room and installed on a raised hearth in the original fireplace, from which all original elements have been removed. Water pipes previously channelled into the wall fabric, as part of the 20th century caretaker's conversion to supply the kitchen sink and tap outlet over the stove, were removed in the 1990s. A 1944 plan shows a dotted line through the centre of the room which may indicate the erection of a partition wall; if so, it had been removed by the 1970s. The walls were rendered and painted, a timber picture rail installed and the ceiling painted, probably on conversion to the caretaker's residence. The kitchen cupboards and sink unit were removed prior to the removal of cement render from the walls in 1997 (**Figures 39 and 40**). The floorboards were removed and replaced with compressed fibre cement sheeting in 2000, and the stone walls and ceiling protected and obscured by false walls and ceiling (**Figure 40**) prior to the fitting out of the room as a commercial kitchen (**Figure 42**). The kitchen fittings, false walls and ceiling were all removed in 2018.



Figure 39 Room B4 looking east, after removal of kitchen sink and cupboards (NPWS 1997)



Figure 40 Room B4 looking east, after removal of render (NPWS 1997)



Figure 41 Room B4 looking east, showing over-sheeted walls and ceiling with access hatches (NPWS 2000)



Figure 42 Room B4 looking north-east, showing kitchen fit-out (Orwell & Peter Phillips 2016)

Room B5: This room was constructed as one of five almost identical barracks rooms for the enlisted gunners. The room contains original 12-pane double hung sash windows (repaired in the 1990s, with new timber window boards installed over the internal stone sills), and an original framed and braced external door (also repaired in the 1990s). Internal timber-framed and boarded doors giving internal access to Rooms B4 and B6 probably date from the early 20th century, most likely introduced after the change in use to caretaker's residence; these were also repaired in the 1990s. The room contains a central fireplace on the south-east wall; the stone hearth is original although the raised brick hearth and cast-iron surround are later elements. Nothing remains of the original Board of Ordnance hob grate or chimneypiece. A 1923 plan shows a partition dividing the room; the 1944 plan shows this room as the Living Room with the partition no longer present. The plan also indicates construction of a new hearth. During the MSB period this room was referred to as the Living Room and the walls were rendered and painted with a timber picture rail, and the vaulted ceiling was painted. A photograph taken in 1997 shows an early 20th century timber chimneypiece in front of a boarded over fireplace (**Figure 43**). In 1997 the chimneypiece was removed (and is no longer on site) revealing the present cast-iron surround. During the same period the render and paint were removed, the floorboards were all taken up, the subfloor structure recorded and repaired, and the original floorboards were re-laid, with brass grilles inserted along the walls to assist with subfloor ventilation and treatment of rising damp

(**Figure 43**). Brass balustrades were installed around the walls for protection. Some evidence remains of the original limewash finish.



Figure 43 Room B5 fireplace detail (left), and Room B5 looking east (right), after render removal. Note the timber chimneypiece removed from the fireplace (NPWS 1997)



Figure 44 Installation of brass ventilation grilles and balustrades, Room B5 (NPWS 1999)

Room B6/B7: This room was constructed as one of five almost identical barracks rooms for the enlisted gunners. The room contains original 12-pane double hung sash windows (repaired in the 1990s, with new timber window boards installed over the internal stone sills). The external framed and braced doors to the terrace and breezeway appear to date from the original fort (they were repaired in the 1990s). The 1923 plan shows the room undivided, while the 1944 plan proposes the room being divided for use as bedrooms, with the partition extending into the fireplace. However, it appears that the fireplace was instead bricked up before the partition was installed. The timber partition, which appears to have been lined with reused floorboards, possibly from the southern barracks rooms (**Figure 45**) was removed in 1997. Subsequently the render was removed, revealing the bricked up fireplace (**Figure 46**) which was presumably reopened shortly afterwards. As with Room B5, the floorboards were all taken up, the subfloor structure recorded and repaired, and the original floorboards were re-laid, with brass grilles inserted along the walls to assist with subfloor ventilation and treatment of rising damp. Brass balustrades were installed around the walls for protection. Some evidence remains of the original limewash finish. The Warmray solid fuel heater now installed in the fireplace is likely to date from the 1950s when these appliances were

commonly manufactured and sold. In 1997 it was found in the fireplace of Room B9 (**Figure 47**) and was probably moved to its present location shortly afterwards.



Figure 45 The timber partition formerly dividing Rooms B6 and B7 (NPWS 1997)



Figure 46 Room B6/B7 after removal of render, showing bricked up fireplace (NPWS 1999)

Space B8: The breezeway provides covered access from the wharf through the barracks building to the battery. The walls are stone, some areas remaining cement rendered while others have sacrificial render. The original specification required the entrance to the battery to be protected with a strong iron gate²¹⁶, which is visible in early photographs as an outward opening door with an arched head (**Figure 11**). According to the 1999 NPWS conservation plan, the large pair of doors through the breezeway (presumably the doors towards the rear, a pair of timber-boarded doors which like the few remaining iron shutters are hung on hinge pins set directly into the stonework) were replaced c.1960s, although they appear to be original, except for the vision panels which may well have been installed in the 1960s. The arched pair of inward opening doors at the terrace entrance to the breezeway are hung on iron hinges fixed to a timber frame, and appear original, as do the timber-framed and braced doors from the breezeway into Rooms B7 and B9; all were repaired in the late 1990s.

Rooms B9/B10: Room B9/10 was constructed as one of five almost identical barracks rooms for the enlisted gunners and contains original 12-pane double hung sash windows (repaired

²¹⁶ Kerr 1986, p 23.

in the 1990s). The external timber-framed and braced door from Room B9 into the breezeway appears to date from the original fort; it was repaired in the late 1990s. The 1923 plan shows the room divided by a partition and associated internal door, which on the 1944 plan is shown as being closed. Room B9 is shown on this plan as a bedroom. The 1970s MSB drawing also notes this room as a bedroom and the adjoining Room B10 as a store. The present partition and ledged and boarded door evidently date from the early 20th century. The fireplace has an original cast-iron chimneypiece (stamped VR, like that in the West Room) which has been adapted to suit the later brick hearth and late 19th century cast-iron surround (from which the grate is missing); the original stone hearth survives underneath, and a 20th century timber mantel on brackets over the fireplace. In 1997 the Warmray solid fuel heater now in Room B6/B7 was in front of the fireplace. In the conservation works that followed, the picture rail was removed and the render was cut away around the seating of the iron beam, but elsewhere was retained. It is unclear from the photographic record whether floorboards in this room were removed and replaced as in most other rooms; they appear to date from the first half of the 20th century. The room currently houses interpretive displays.



Figure 47 Room B9/B10 before conservation, showing timber partition, picture rail and solid fuel stove in front of later fireplace (NPWS 1997)

Room B11: This room was constructed as one of five almost identical barracks rooms for the enlisted gunners. The room contains original 12-pane double hung sash windows (repaired in the 1990s). The external framed and braced timber door onto the terrace appears to date from the original fort; it too was repaired in the 1990s. The original fireplace and hearth survive, although the cast-iron VR chimneypiece has been removed. The hob grate at present in the fireplace, although probably dating from the mid-19th century, is unlikely to have been located here originally – it is of a different pattern to all others on the island (including the surviving grates in the former officers' quarters) and bears no military or government markings. Further investigation is needed to determine how this element is associated with the fort. The 1923, 1944 and 1970 plans show the room divided by an internal partition with an internal door (the 1970s plan incorrectly shows the partition as a masonry wall, and shows the uses of the two rooms as work room and watchmen's room), but the only evidence of this by 1997 was a timber rail spanning the room at door head height (**Figure 48**). The 1923 plan shows an internal door through the stonework to join this room with B12, which like all other such internal doors is likely to date from the early 20th century. A number of internal stones were indented at some time before 1992. The original timber floor has been replaced, probably at some time in the late 20th century. It is possible that the floor structure was also replaced at the same time, as the boards in this room run north-west to south-east, perpendicular to those in the other barracks rooms to the north. The room currently houses interpretive displays.



Figure 48 Room B11 after metal conservation, showing high level timber rail (NPWS 1997)

Room B12: This room was originally constructed as one of two rooms in the officers' quarters and contains original 12-pane double hung sash windows (repaired in the 1990s). The internal four-panel Victorian timber door to the lobby (Room B13) and its moulded architraves appear to date from the original fort, and were more elaborate joinery elements appropriate to the officers' quarters. The moulded timber architraves have been reproduced at the door leading to Room B11, although this door would have been added after the military period. The corner fireplace retains its original stone hearth, cast-iron hob grate and chimneypiece, and timber mantel shelf. Internal wall surfaces are likely to have been plastered originally, as evidenced by the timber staff mould to the salient corner of the lobby walls. The timber floorboards have been replaced, probably at some time in the 20th century, as the boards are narrower than those in the northern barracks rooms; they also run north-west to south-east. The 1944 plan notes this room as the Engine Room (possibly for a generator). In the 1970s plan it was noted as a Fuel Store. It now functions as the NPWS office.

Room B13: This room serves as the entrance lobby into Rooms B12 and B14, as noted on the 1856 plan. It has an external framed and braced timber door which appears original. This door, like all other external doors, was repaired in the 1990s. The internal doors leading to the former officers' rooms are four-panelled timber doors, with similar moulded architraves to those on the interior side of the door case. The door jambs have external hinge pockets, evidence of the doors previously being rehung to swing outwards as shown on the 1944 plan; they now swing inwards. The timber floor of this area is contemporary with the flooring in Room B12.

Room B14: This room was originally constructed as one of two rooms in the officers' quarters and contains original 12-pane double hung sash windows (repaired in the 1990s). The internal four-panel Victorian timber door to the lobby (Room B13) and its moulded architraves appear to date from the original fort, and were more elaborate joinery elements appropriate to the officers' quarters. During the early 20th century, a door opening was made to the adjoining Room B15, as shown on the 1923 and 1944 plans, but by 1970 (when Room B15 had been converted to a female visitors' toilet) the opening had been closed up on the other side of the wall, although the door and its moulded architraves (similar to that between Rooms B11 and B12) were still in position (**Figure 49**). In 1999–2000, the room was adapted for use as the men's toilets, with steps up from the door to a raised false floor, and false walls for mounting and concealing services. The original fireplace with remnants of the hob grate and cast-iron chimneypiece have been preserved behind a glass vision panel.



Figure 49 Room B14, showing former door to Room B15 (left) and work in progress to remove services (right) from former use as generator room (NPWS 1997)

Room B15: The 1856 plan notes this room as the Officers' Kitchen and shows an external door through the north-west facing wall. A new opening into the room from the lobby adjoining the West Room (Room W3) is likely to have been made in the early 20th century, at the same time as other openings for internal circulation. The room was shown as a store on the 1944 plan, but by the 1970s had been converted to the female visitors' toilet (**Figure 50**). The current concrete floor may have replaced an earlier timber floor. The original external door was converted in 1985 to an explosives store for the one o'clock gun, reusing an iron shutter from one of the windows as a door.



Figure 50 Room B15 (left) before conservation and fitting out, and the former external door to this room converted for an explosives store with a reused iron shutter (NPWS 1997)

3.2.3 Tide Gauge Room

Originally constructed as a loopholed rifle chamber between 1858 and 1862, the room was largely rebuilt by the Sydney Harbour Trust in 1910 to accommodate a tide gauge. Timber-framed glazed casement windows probably dating from the early 20th century infill the original loophole openings. A 1923 plan shows a small partition and lobby to the Tide Gauge Room. This partition was still in place on the 1944 and 1970s plans.

Major building upgrading works undertaken in the 1970s and again in 1983 by the MSB included demolition of the central partition, new concrete and tile floor, new internal and external timber doors and major external sandstone repairs.

3.2.4 West Room

The West Room (Room W1) and associated lobbies (Rooms W2 and W3) were added between 1858 and 1862 in the final phase of construction of the fort. It is unclear what became of the officers' privy that was previously planned to be located where the southern lobby (Room W3) is now – possibly it occupied part of this room which is rather wider than necessary for circulation. J S Kerr's sketch plan of the West Room and lobbies notes an existing iron door at the entrance from the slip yard to the lobby (Room W3), and the site of a former iron door (indicated by the remnant hinge pin) at the entrance from the terrace to the lobby (Room W2); interestingly, the existing iron-sheeted timber door to the West Room itself is not recorded. The sketch also notes iron pegs mounted on the lobby wall, together with an original iron rack and peg system on the north-west internal wall. Kerr also notes that the corner fireplace has been inserted, presumably on the basis that a previously built loophole has been blocked up by the chimneybreast, and that the fireplace has no masonry chimney above the roof, only a small pot or flue in the corner of the parapet wall. The fireplace addition is likely to have occurred soon after the construction of the wall, as the chimney pot is visible in early photographs (**Figure 11**). The flue was still present in 1996 (**Figure 51**); it has since been removed and the top of the parapet wall over-sheeted with roofing membrane. Some of the timber-framed casement windows in original loophole openings may date from the early 20th century, after acquisition by the Sydney Harbour Trust; these are hung on conventional hinges. Other windows hung on casement friction stays are likely to date from the second half of the 20th century. The iron-faced timber door to the West Room appears to be original.

The 1923 plan shows a small ficus bed located on the south-eastern wall of the West Room, which is shown also on the 1944 plan; neither plan indicates the use of the room at this time. The 1970s plan notes this room as a tea room. Numerous stone indents have replaced much of the original stonework to the internal wall surfaces of Room W1 (some have themselves been replaced), while the north-east and south-west walls of Rooms W2 and W3 have been overlaid with additional sandstone walls. All this stonework may have been undertaken at the same time as the stonework in B11. Major building upgrading works were undertaken in the 1970s and again in 1983, including a new concrete floor.

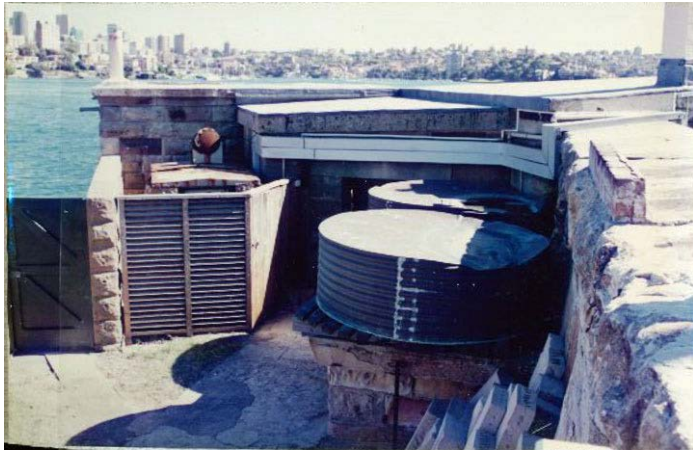


Figure 51 Looking north-west over the West Room roof, showing the corner flue. Note also the former substation and corrugated metal water tanks (NPWS 1996)

3.2.5 Terrace and landing place

According to the 1856–57 plan, the original landing place for the fort prior to construction of the seawall was located at the south-eastern end of the island. This plan shows the location of an intended wall along the north-western side of the island, but the retaining wall eventually built had an angled configuration, with a double set of landing steps at the change of direction, opposite the centre of the barracks and in line with the archway (**Figure 52**). The timber wharf was constructed to one side of the steps in 1901 after transfer of ownership to the Sydney Harbour Trust, and the landing steps were subsequently removed and the wall reconfigured (with a stone pier at the junction) between 1913 and 1923 (**Figure 53**). There is no visible evidence of the original steps, although their location is indicated by a change in the lowest course of the wall. Although the form of the present wharf was established in the early 20th century, it has since been rebuilt at least once.



Figure 52 Photo taken after 1913 showing original landing steps on left and 1901 wharf on right (Detail from State Library of NSW, Star Photo a_089117u.)



Figure 53 The location of the former landing place viewed from the terrace, marked by changes in the stone base course. This view also shows the sole surviving palm tree (Orwell & Peter Phillips 2018)

Various garden bed arrangements and lawn areas are noted on the 1923 plan. A note on one of the garden beds shown on the plan states ‘take out palms and renew soil’, which suggests that the garden bed in question had been established prior to this date. The other palm trees shown on this plan appear as young specimens in an early 20th century photograph (**Figure 54**), and more advanced in a 1948 photograph (**Figure 22**). Comparison of these photographs with later historic images (**Figures 56 and 31**) suggests that the sole surviving palm tree dates from before 1923 and has grown very slowly. A series of gullies and drains out through the terrace stone wall are noted on the plan, some existing and others proposed. The terrace has been resurfaced a number of times, the most recent bitumen surface being laid in 2000 after installation of new services (see below). A modest 15-metre long marquee was erected in the courtyard in 2009; it was extended to 24 metres in 2010 and further lengthened to 30 metres in 2013. The marquee was removed in 2017.



Figure 54 The terrace looking north-east, showing garden beds indicated in 1923 plan and young palm trees (Cecil S Harnett, Government Printing Office 1-04850, undated. State Library of NSW)



Figure 55 The former marquee on the terrace (Orwell & Peter Phillips 2016)

3.2.6 The battery and bastion

The battery was constructed from 1840–42, and the bastion from 1856–58. There has been little change to the battery since 1862 apart from the removal of original ordnance and the replacement of the original ground surface with grass, obscuring evidence of the original iron traversing pivots and races. The signal mast, originally mounted on top of the Martello tower (**Figure 11**) was moved to its present location after the light was installed there (**Figure 18**), and according to the 1944 plan was reconstructed and replaced at that time. No evidence remains of the former domestic sheds shown on the 1923 plan, although one of these (possibly the greenhouse mentioned on the 1944 plan) is visible in a photograph of the 1960s (**Figure 56**), together with a set of timber stairs giving access to the flat roof. Minor additions include the concrete AA-gun mount in the bastion, added during World War II. A second set of timber stairs from the battery level to the slip yard is shown on the 1944 plan.

3.2.7 Defensive ditch

The 1862 defensive ditch was still functional 100 years after it was constructed (**Figure 56**) but has deteriorated greatly since that time presumably due to increasing vessel wash and wave action. The ditch is now only visible at low tide.

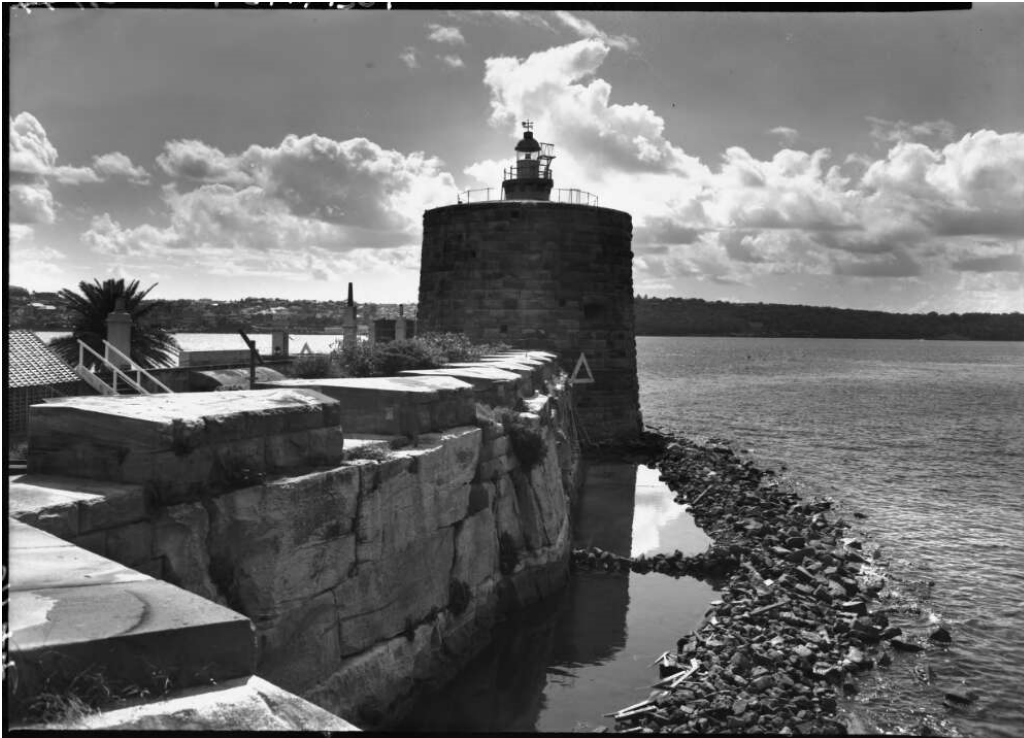


Figure 56 The defensive ditch in 1962 (National Library of Australia, Fort Denison [3] picture, obj-160050208) Note the roof of a shed on the battery, and the roof access steps

3.2.8 Slip yard and slipway

The slip yard and slipways were constructed in 1917. An embrasure was also constructed at the same time for the one o'clock gun, and two Monier water tanks on a tank stand were installed; they were later replaced by corrugated iron tanks which were present in 1986. There were still two corrugated water tanks in position in 1996 (**Figure 51**); they were removed in about 2000 in conjunction with the installation of the new substation. The 1944 plan also showed a lavatory beside the water tanks; this had been removed by the 1970s. The one o'clock gun was noted on the 1944 plan as being restored in its former position, although it is not clear whether this refers to the 1917 embrasure or its original location in the southern bastion; at all events, the firing of the gun (from its current position) was not resumed until 1986.²¹⁷ The boat rails in the slip yard were shown in the 1944 plan to be removed, 'placing baths in original position'; the 1999 conservation plan notes that the area was a swimming enclosure in the 1960s. According to the 1999 conservation plan, a Hills hoist was erected in the slip yard in the 1960s. The stone wall and gate separating the slipway from the slip yard was constructed in 1984 by Public Works. The stone blocks in the original one o'clock gun embrasure position were used as a barbecue, probably from at least the 1970s when the slip yard is shown on the MSB plan as a barbecue area. A covered storage area was added in 2013.

²¹⁷ Kerr 1986, p 45.



Figure 57 The water tanks in the slip yard removed (NPWS 2000)

3.2.9 Services generally

Few services apart from water storage were required as part of the original design and use of the fort. Sewerage and sullage was disposed of directly into the harbour. One of the major impacts on the fabric of the fort since the completion of its construction in 1862, has been the introduction of services provided as part of its 20th century use as a navigational aid, residence and tourist facility. Water storage, waste disposal and power services are now considered a necessary, though often neglected, aspect of the building fabric that are critical to its functioning.

Significant damage to the fort has been sustained in the past by the careless introduction of services, such as the intrusive penetration of submarine cables and drainage pipes through the external sandstone terrace wall and channelling and mounting of electrical conduits and water pipes into and through the internal sandstone walls.

3.2.10 Water tanks

References to the earliest fort construction note the provision of iron water tanks for the convict labourers. The provision of water has remained a critical issue in the use of the island. Originally water tanks were planned to be built into the Martello tower; however, possibly to lessen the possibility of salt contamination, an underground tank was instead cut into the battery bedrock.

Sometime before 1917, the Sydney Harbour Trust installed two Monier concrete water tanks in the slip yard area adjacent to the battery. The 1923 plan shows a two-inch water pipe from these tanks to the wharf, and J S Kerr notes that the tanks were filled periodically by pumping water to them from a boat at the wharf. The corrugated metal tanks that replaced the Monier tanks were removed in 2000. Mains water is now provided via a PVC pipe from Garden Island. The original underground water tank located on the battery has an automatic pump installed to drain seepage.

3.2.11 Drainage

Rainwater from the buildings is discharged either directly into the harbour or (in the case of the barracks) through a spitter on to the terrace. Surface water on the terrace is discharged into the harbour through surface drains, which were last renewed in about 2000. Water seepage through bedrock at the rear wall of the barracks, combined with seawater in the subfloor area at very high tides, continues to cause rising damp problems in the barracks walls. In about 1923 a 600-millimetre wide, two-metre deep open drain was cut behind the

eastern residential section of the barracks (drawing Q2/151). Stormwater discharges via this drain into a pipe through the entrance lobby to the northern terrace and to the harbour. A surface drain at the other end of the barracks discharges to the harbour through the southern courtyard. Below the bitumen surface of the terrace and the crushed stone surface of the slip yard, seawater flows in and out of the subsurface material through weepholes deliberately left in the seawalls. This has resulted in some local subsidence behind the seawalls, which has increased recently owing to increased wave action from passing vessels couple with high tides and rising sea levels, resulting in seawater washing over the seawalls.

3.2.12 Sewerage

Until the late 1980s sewage was discharged directly into the harbour from toilets at either end of the barracks; the male visitor toilet at the north-eastern end of the barracks (in the location of the original gunners' privy) and the various toilets at the south-western end: the officers' privy (possibly in Room W3), the lavatory shown in the slip yard in the 1944 plan, and the female visitors' toilet located in Room B15, shown on the 1970s MSB plan and probably in use as such before then. Two septic tanks servicing the male and female toilets were formerly concealed in garden beds at either end of the terrace. The tanks were converted to biocycle tanks around 1988, and these in turn were replaced with sewer pumping tanks following the connection of the island to the mainland sewer lines. A new sewer line was installed in 2000, together with a grease trap for the new commercial kitchen.

3.2.13 Electricity

Electricity to the fort for the navigation light had been supplied by a submarine cable from the Fort Macquarie Electric Light Station as early as 1905, but after repeated failures it was abandoned and a generating plant was installed in the 1920s.²¹⁸ The generator and its associated equipment were housed in Rooms B12 and B14 until 1970, when a new submarine cable from Garden Island was installed. Prior to 1992, a new switchboard was constructed in the West Room lobby (Room W3). The substation installed presumably in 1970 was replaced by the present unit in 2000, and the submarine cable was also replaced at this time.

For many years telephone services also came by submarine cable from Garden Island. The cable onto the island was located near the old ficus bed at the foot of the tower and fed through a wall vent in the back of the barracks to connect to the mainframe on the north wall of the residence kitchen (Room B4). Following damage to that cable a new telephone cable was laid to the island in early 1995 from Mrs Macquarie's Point, via the slipway area and connected into a new mainframe in the utility cupboard (Room W3).

3.2.14 Repair and conservation works

In 1944 the MSB undertook repair works directed mainly at the residential section (drawing Q2/468). At the time of the fort's centenary in 1957, concerns were first expressed for its conservation. In 1957 sandstone repair works were undertaken, although apparently using poor quality stone which later had to be replaced. In the late 1970s further sandstone works were documented (drawing A01862) but not completed until a major sandstone restoration programme was undertaken by the Public Works Department (PWD) for the MSB between 1983 and 1992. During this period expenditure on Fort Denison was just over \$1 million with a little under half of this spent on materials and labour for sandstone restoration. In 1993–94 and in 1994–95 further works were undertaken for the NPWS by the PWD with funding from the PWD Stonework Restoration Programme. Appendix 3 details the major sandstone restoration undertaken by the PWD for the MSB and in 1993–95 for NPWS. Between 2007

²¹⁸ Kerr 1986, p 44.

and 2010 sandstone and metals conservation works were undertaken within the barracks rooms and Martello tower and repairs made to the asphalt flooring of the magazine. The commercial kitchen and associated fit-out was removed from rooms B2-B4 of the barracks building in 2018 and stone conservation work and flooring repairs carried out in rooms B2-B7 of the barracks building in 2019.

3.3 Archaeology

3.3.1 Nature of archaeological potential

Archaeological potential is the degree to which archaeological remains are considered likely to survive within the study area in light of modern impacts and historic activities. A series of assumptions and general principles underlie the analysis of archaeological potential for colonial remains. These have been based on the experience of archaeologists working in New South Wales over the last 40 plus years.

- Structural remains (i.e. building footings) associated with buildings and shown on plan are likely to survive but will be impacted by later phases of building.
- Certain types of remains are typically not shown on plan, although they occasionally feature on later plans. These include:
 - wells
 - cesspits
 - site drainage
 - rubbish pits
 - evidence for gardens, layout and use of the yard areas
 - pet burials
 - fence lines, assisting with clarification of lot boundaries and internal use of lots
 - pollen and soil evidence
 - land clearing and modification of the landform, including major filling events, e.g. backfilling of ponds or the creek line and more ephemeral evidence of land use including plough, hoe and drainage channels
 - underfloor deposits associated with the occupation of the house
 - rubbish dumps
 - other types of archaeological deposits.

There are also several other common processes which determine the archaeological resource. Generally, the following principles apply:

- The greater the number of phases, the more complicated the nature of the archaeological remains.
- Underfloor deposits typically form where the original flooring was butt-boarded timber floorboards.
 - These can survive in both demolished and standing structures, although the installation of later services and the replacement of flooring can impact on the integrity of underfloor deposits.
 - Underfloor deposits can include both small items which fell between floorboards, and larger material which must have been deliberately deposited beneath loose floorboards.
 - Floor coverings such as oil-cloths and carpets can minimise the accumulation of items underneath a butt-boarded timber floor. Floor coverings like these would be more common in wealthier households.

- Subsequent replacement with tongue and groove floorboards or even capping the underfloor void with imported material (a strategy popular for dealing with rats),²¹⁹ often will only have a limited impact on any archaeological deposit.

3.3.2 Previous archaeological investigations

Fort Denison has undergone several archaeological inspections, investigating both the built fabric and subsurface features of the site. These programs include:

- small-scale archaeological testing within the terrace, including monitoring the installation of septic tanks there (Wilson 1987)
- archaeological recording of the built fabric, and the excavation of two small test trenches in the terrace (Gojak 1997)
- archaeological testing within the terrace and battery, and inspection of underfloor deposits within several rooms of the barracks (Mider 1997)
- salvage excavations in several rooms of the barracks (Mider 1998)
- maritime archaeological investigations (Cosmos Archaeology 1999 and ANMM 2007).

Those areas on Fort Denison that have undergone archaeological excavation or salvage investigation are illustrated in **Figure 58**. The following discussion examines the results of archaeological investigations by each area on the island, specifically the terrace, the barracks, the battery and maritime.

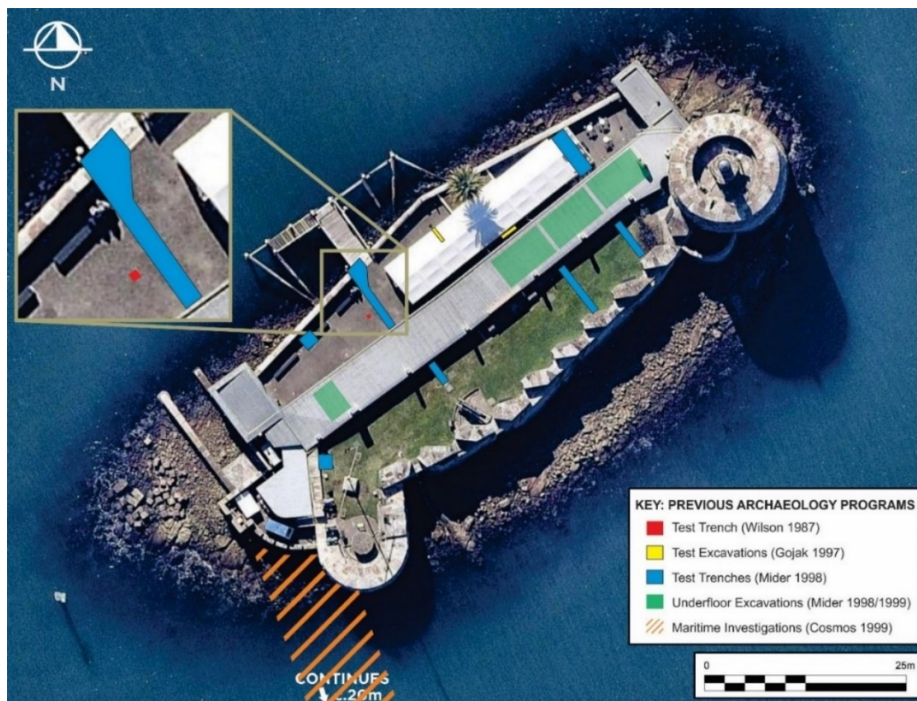


Figure 58 Plan of Fort Denison showing areas that have undergone archaeological excavation, testing or maritime inspections. Excavation has focused on the terrace, barracks and battery. Note that the maritime investigation (marked with orange hatching) extended for c.50 m to the south-east, although only c.20 m of this surveyed area is depicted here²²⁰

²¹⁹ This practice was observed at workers' housing excavated as part of the Darling Quarter redevelopment – Casey & Lowe 2013 *Darling Quarter (formerly Darling Walk), Darling Harbour, Sydney* [Archaeological Investigation], for Lend Lease Development, December 2013, pp.412–3.

²²⁰ Cosmos Archaeology 1999, *Maritime Archaeological Inspection for the Fort Denison Sewer and Power Project*, report prepared for NSW National Parks and Wildlife Service, March 1999, fig. 1.

3.3.3 The terrace

The terrace has undergone three small-scale excavation programs (in 1987, and two in 1997). The following summary draws largely from the results of the more recent and more comprehensive excavations undertaken by Mider (1997), which focused on three areas along the terrace. Archaeological remains on the terrace were significantly disturbed by the installation of several services (including two septic tanks) in 1987, which involved the removal of substantial deposit here. Nonetheless, excavations revealed several discrete phases, specifically:

- The initial levelling and construction of Fort Denison, characterised by a bedrock and crushed sandstone rubble fill.²²¹
- An 'ash and loam fill' dated to the military occupation of Fort Denison (c.1840–1910), and apparently acting as a levelling fill and surface of the fort. Mider suggests these may be occupational deposits and they appear to be a dump of ash and soot from household fires.²²²
- A sequence of superimposed layers of bitumen and cement yard surfaces (installed c.1923) and associated landscaping activities. Testing also revealed two significant structural features: the former garden path leading to the wharf, and a (pre-1923) ceramic gully trap with associated stormwater pipe outlet.²²³ These features all post-date the military occupation of Fort Denison.
- The latest phase of activity, characterised by the sealing of earlier garden beds (post 1986) and installation of multiple services in the late 20th century.²²⁴

Analysis of the terrace deposits suggests most artefacts here were introduced to Fort Denison within soils used as levelling fills for the bitumen and concrete yard surfaces in the 20th century.²²⁵

3.3.4 The battery

Archaeological investigations of the battery revealed several distinct phases, specifically:

- The initial levelling and construction of the terreplein and parapet in 1840–42. Similar to the terrace, the surface of the original battery was characterised by ash deposits or lenses overlying a bedrock and crushed sandstone rubble fill. Towards the western end of the battery, this surface is characterised by exposed bedrock. The ash and sandstone fills appear to relate to the occupation of the fort and date to both the initial, and subsequent (c.1956–62) construction phases.²²⁶
- The second phase of construction, characterised by the installation of gun races and emplacements, drainage channels and a rock-cut water tank (c.1856–62). The gun race foundations were cut through the layers of ash and sandstone fill.
- Several surfaces as well as a sandstone garden bed possibly dated to the period between 1858–62 and 1923.

²²¹ Mider 1998, pp.5,6.

²²² Mider 1998, p.5.

²²³ Mider 1998, p.5.

²²⁴ Mider 1998, pp.5–6.

²²⁵ Mider 1998, p.11.

²²⁶ Mider 1998, p.7.

- The most recent phase, characterised by layers of introduced soil and turf dating to landscaping between 1923 and 1944. The gun races were buried at this time.
- Additionally, several surface features which post-date 1944, mainly remnant stone paving, brick upstands and several cement patches.²²⁷

Many of the artefacts recovered from the battery trenches post-date 1923 and were introduced to Fort Denison within levelling fills brought in between 1923 and 1944. These artefacts do not relate to the occupation and use of the island, although several artefacts were also recovered from deposits relating to the 1842 to 1856–57 and 1858–62 occupations.²²⁸

3.3.5 The barracks

Archaeological investigations within the barracks consisted of the complete excavation of subfloor deposits within four rooms (Rooms B4, B5, B6/7 and B14),²²⁹ representing approximately 50% of the total subfloor deposits. Following excavations, the floorboards in Rooms B4, B5, and B6/7 were replaced in their original (pre-excavation) positions.²³⁰ The installation of a generator in Room B14 in 1926–27 appears to have significantly disturbed the underfloor deposits here. The floors in this room were neither recorded nor retained.²³¹

Excavations revealed the subfloor cavities in Rooms B4, B5 and B6/7 were quarried (in 1856–57) to below the high tide mark. These cavities were consequently filled with seawater during periods of higher than average tide. The rooms had not been cleared out or disturbed, and at least two discrete artefact layers were evident. The archaeological deposits within these rooms date from between c.1856–57 and 1998. Artefact analysis suggests the original specified room uses (as indicated on the 1856–57 plan) were likely not adhered to, and a number of the communal barracks rooms were apparently used as accommodation for gunners and their families.²³²

3.3.6 Maritime investigations

Maritime investigations were undertaken in 1999, prior to the installation of a new sewer and power line. Survey focused on a c.50-metre long transect extending from the south-west corner of the fort.²³³ Three zones were defined:

- Zone 1 (at 0 to 18 m²³⁴) was largely characterised by the rubble of ashlar masonry, interspersed with complete and fragmentary sandstock bricks. A length of detached ferrous pipe was also recorded and may be associated with the original sewerage outfall for the latrines here (installed c.1856–57). Additionally, several more modern ‘objects’ were observed at the base of the bastion. These are directly related to stabilising works here in the 1990s.²³⁵

²²⁷ Mider 1998, pp.7–13.

²²⁸ Mider 1998, p.11.

²²⁹ Mider 1999, pp.7-13.

²³⁰ Note that during the use of these rooms for the Fort Denison café / restaurant the ‘original’ floorboards in Room B4, which served as the café kitchen, were replaced with modern flooring.

²³¹ Mider 1998, p.9.

²³² Mider 1999, pp.1-7.

²³³ At the intersection of the Bastion and slip yard, Cosmos Archaeology 1999, p.6, fig. 1.

²³⁴ Slope distance, see Cosmos Archaeology 1999, p.9, note.

²³⁵ Cosmos Archaeology 1999, p.9, fig. 2.

- Zone 2 (at 19 to 30 m) was defined by a fine sandy sediment. Artefacts included several sandstock bricks and the occasional glass bottle (dating from the 19th century and more recently). Various ferrous objects were also recorded, some of which may date to the earliest uses of the fort.²³⁶
- Zone 3 (at 31 to 42 m) was characterised by a shell (predominantly mussel) matrix. Artefacts consisted mainly of glass bottles, of a typically recent date.²³⁷ The surveyors also noted a sandstone outcrop within this area that may have served at some point as a 'rock shelter' and has the potential to contain pre-European archaeological remains.²³⁸

The results of these archaeological programs have proved particularly instructive with regards to the types, and likely preservation, of archaeological remains that may be expected within the study area (see Fort Denison archaeological potential below). In addition, the analysis of sea level rise has been used to establish the effect of the tide on archaeological potential at Fort Denison.²³⁹

The Australian National Maritime Museum (ANMM) undertook a maritime archaeological diving survey around Fort Denison in 2007. The survey located two large iron wheels on the harbour-floor to the east of the wharf and a large iron grate off the slipway.²⁴⁰

3.3.7 Site visit 2018

On 22 February 2018 Tony Lowe, Casey & Lowe Pty Ltd, visited the study area (**Figure 59**) in the company of Peter Phillips, Orwell & Peter Phillips, and Robert Newton, NSW National Parks and Wildlife Service. Much of the original fabric and features, including the convict shaped rock battery (1840–42), and later casemated barracks, tower, and bastion (1856–62) are intact, although significant restorations and repairs to the stonework and fittings is evident.



Figure 59 Aerial view of Fort Denison, taken from the south-west (NPWS 2017)

²³⁶ Cosmos Archaeology 1999, pp.9, 11, fig. 2.

²³⁷ Cosmos Archaeology 1999, p.11, fig. 2.

²³⁸ Cosmos Archaeology 1999, pp.11–12.

²³⁹ See Watson and Lord 2008.

²⁴⁰ Australian National Maritime Museum, Fort Denison Preliminary Maritime Archaeology Survey, May 2007, p.3.

By 1986 Kerr noted that much of the ashlar retaining wall (holding the breakwater rocks out of the wet ditch) had been robbed and a number of ashlar blocks were visible dumped to the west of the slip yard. This dump is observable today, although the breakwater wall extends at least half the length of the battery (**Figure 60**).



Figure 60 View looking north-east over the south-east face of the battery (from the bastion), showing the wet ditch and breakwater. Sandstone bedrock is visible underlying the parapet at left (Casey & Lowe 2018)

The original surface of the battery terreplein is now covered with turf (**Figure 61**), and the installation of several 20th century landscaping features (including garden beds and drainage channels, as well as modern services and the concrete gun mount) (**Figure 62**, **Figure 63**, **Figure 63**) are expected to have impacted earlier deposits here. A single gun race, and mounted gun, is installed within a (modern) concrete pad along the terreplein (**Figure 63**). Additionally, several 'ghost' gun races are visible at the modern surface level, and excavations suggest more subsurface features can be expected.



Figure 61 View north-east along the battery towards the Martello tower, with the barracks to the left (Casey & Lowe 2018)



Figure 62 View of the bastion looking south, showing the concrete gun mount (installed c.1942) and flagpole. Several mounted guns have been installed along the western wall (Casey & Lowe 2018)



Figure 63 View south-west along the battery towards the bastion, with the barracks to the right. Several service and tank access points are visible in the foreground (Casey & Lowe 2018)



Figure 64 View south-west along the battery, showing the c.1923 drain installed against the barracks to prevent rising damp in the walls. An early 20th century garden bed (with fig tree) is in the foreground (Casey & Lowe 2018)



Figure 65 Gun race along the battery terreplein, looking south. Several ‘ghost’ gun races are visible at the modern surface level and testing excavations suggest more subsurface features can be expected underlying the 20th century fills (Casey & Lowe 2018)



Figure 66 View to the north-east of the Martello tower, with the barracks to the left (Casey & Lowe 2018)



Figure 67 Interior of Room TB4, at the lowest (magazine) level of the Martello tower, looking south. The impressions of later display items (barrels and cases) are visible in the Seysell asphalt coat on floor (Casey & Lowe 2018)

The casemated Martello tower demonstrates largely original masonry and fittings (**Figure 66**), except for the 1913 light tower and its mechanisms. The impressions of former displays are visible in the Seysell asphalt coat on the lowest level magazine floor (**Figure 67**).

Several superimposed layers of bitumen surface, laid from 1923 onwards, were identified in excavations along the terrace (**Figure 68**). The installation of a number of modern services in 1987, including two septic tanks, involved the excavation of considerable deposit from the terrace. This is likely to have significantly compromised the integrity of the archaeological remains in this area. Additionally, there is visible damage from wave action in the area along the seawall (**Figure 69**). There is no evidence of the former steps situated along the seawall in the centre of the terrace. These were apparently sealed following the construction of the pile wharf in 1901 and may underlie the bitumen surface. Much of the early 20th century landscaping (including garden beds, various gullies and drains) is no longer perceptible, although one of the palm trees (possibly planted in about 1910) remains.



Figure 68 View of the terrace looking south-west, with the barracks to the left (Casey & Lowe 2018)



Figure 69 View looking west along the north-west seawall (the terrace), showing damage caused by wave erosion. Note also the recently installed bollard light (Casey & Lowe 2018)

Archaeological excavations in the barracks Rooms B4 (**Figure 70**) and B5 (**Figure 71**), consisted of the complete removal of floorboards and all subsurface deposits. These rooms (in addition to Room B6/B7) were utilised by the Fort Denison café/restaurant until mid-2017.

Room B4 served as the restaurant kitchen and underwent significant alterations to the built fabric, specifically the replacement of original floorboards and installation of a new chimney along the eastern wall. Several of the barrack rooms remain unexcavated, including those now serving as the Fort Denison museum (**Figure 72**). Much of the internal fabric of these rooms was updated prior to the 1990s. Subsurface deposits are, however, expected, although the addition in some rooms of concrete flooring (**Figure 73**) and services will have disturbed these deposits.

The 1917 slipway (**Figure 74**) and yard (**Figure 75, Figure 76**) are largely preserved, and the installation of a modern shelter in the yard is unlikely to have had any impact on the original structure. While archaeological evidence related to these features may remain intact, the resource is assessed as not meeting the threshold for local or state significance.



Figure 70 Interior view of barracks Room B4 looking east. Excavations were undertaken in this room during 1997–98 and consisted of the complete removal of floorboards and all subsurface deposits. The room served as the Fort Denison café/restaurant kitchen from 2000 (when the floor was replaced) until mid-2017 (Casey & Lowe 2018)



Figure 71 Interior view of barracks Room B5 looking east. Excavations were undertaken in this room during 1997–98 and consisted of the complete removal of floorboards and all subsurface deposits. The room was used as dining space for the café/restaurant until mid-2017 (Casey & Lowe 2018)



Figure 72 Interior view of barracks Room B11, now the museum, looking south. Floorboards were replaced at an unknown time prior to the 1990s (Casey & Lowe 2018)



Figure 73 Interior view of West Room W1, looking south. Most of the interior fabric, including the sandstone wall surfaces, was replaced in the 1970s and a new concrete floor installed in 1983 (Casey & Lowe 2018)



Figure 74 The 1917 slipway, looking west. The boat slips were removed in the late 1940s and the area used as a swimming pool afterwards (Casey & Lowe 2018)



Figure 75 The 1917 slip yard, looking west, with a modern shelter to the right (Casey & Lowe 2018)



Figure 76 View of the bastion and the 1917 wall of the slip yard, looking east, with a modern shelter to the left (Casey & Lowe 2018)

3.3.8 Fort Denison archaeological potential

The potential archaeological remains within the study area were assessed through an analysis of historical records, previous archaeological investigations, and site inspection (see above). It should be noted that Fort Denison is highly vulnerable to any form of sea level rise, and this is expected to have had a significant impact on the potential archaeological remains, particularly along the north-west seawall.

Archaeological potential has been determined using a series of gradations (**nil–low**, **low–moderate** and **moderate–high**) to indicate the degree to which archaeological remains are likely to survive. The types of potential historical archaeological remains identified within the study area are summarised below in **Figure 77** and **Table 3**.

There is a **moderate to high** potential for evidence relating to the original masonry, fittings and construction of the fort. This includes built fabric associated with the original ‘convict shaped rock’ battery (constructed 1840–42 and still extant), the southern bastion, casemated barracks and tower, the wet ditch and breakwater (c.1856–58), as well as the loophole chambers and terrace (c.1858–62). Some restoration and repair work to the original fabric and fittings is evident, although this is largely sympathetic replacement of stonework. The two loophole chambers (the Tide Gauge and West Rooms) have been significantly remodelled (or rebuilt) in the 20th century, and there is **low to moderate** potential for archaeological evidence related to the original built fabric here.

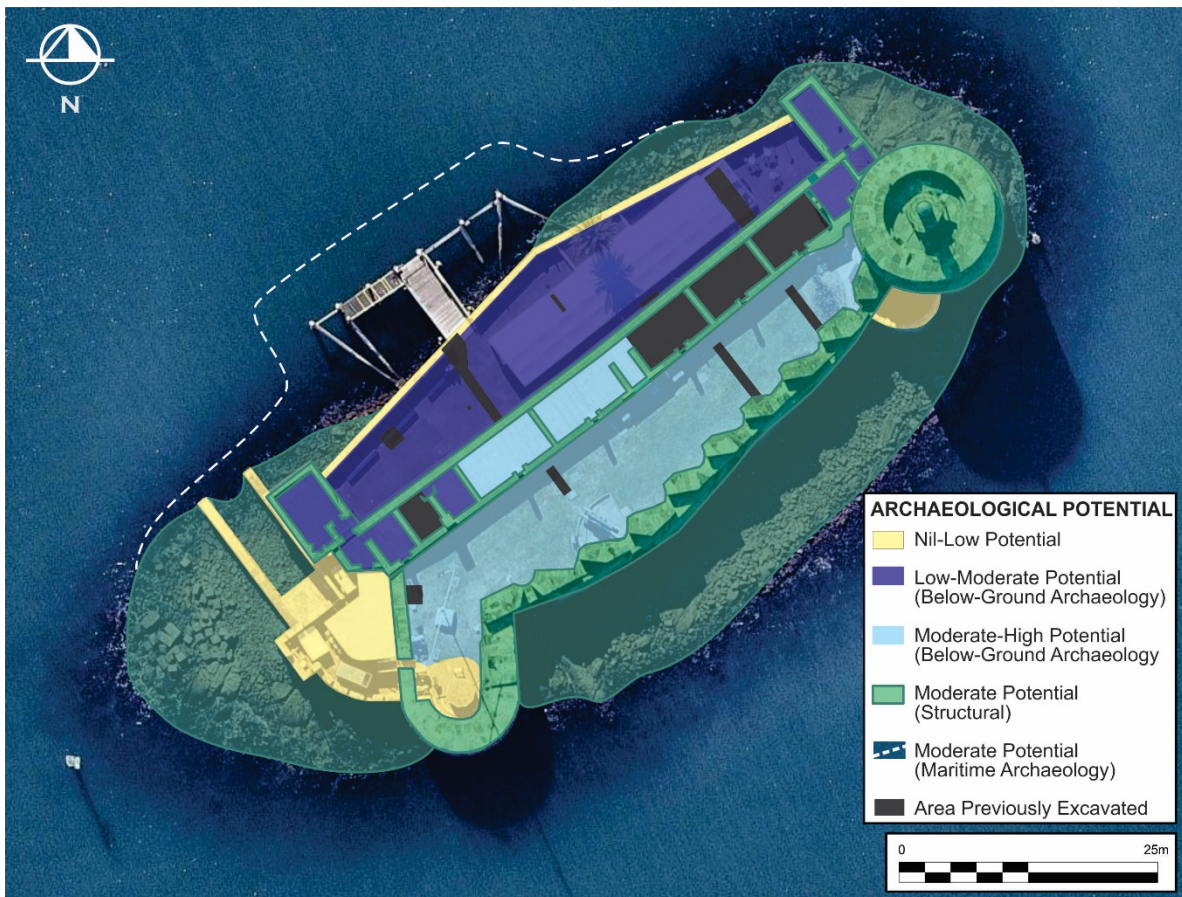


Figure 77 Overlay plan of the study area indicating the levels of archaeological potential. Standing archaeological remains with moderate to high potential are marked with green shading. Areas with moderate to high potential for subsurface archaeological remains are marked in light blue, and areas with low to moderate potential for subsurface archaeological remains are marked in dark blue. Areas shaded yellow were constructed post-1917 and are considered to have nil to low potential for state or locally significant archaeological remains. Areas shaded in black have been subject to archaeological excavation programs and the archaeological resource has subsequently been removed (Plan of potential by Casey & Lowe, Near Maps base plan accessed 28/02/2018)

The results of archaeological testing programs indicate there is a **moderate to high** potential for evidence of early construction and foundation fills along the terreplein, and a **low to moderate** potential for the preservation of similar deposits along the terrace. The installation of several services and septic tanks along the terrace in the 1980s is expected to have disturbed, although not completely removed, the archaeological resource in their locations. Evidence of early foundation fills, as well as the quarrying of bedrock are expected to be preserved. These 'constructional' fills are composed of a combination of quarried bedrock and a crushed sandstone and ash fill dated to c.1840–62. Archaeological testing also revealed several occupational deposits within the terreplein that are dated to this early phase, with two discrete deposits c.1842 to 1856–57 and c.1858–62. These fills and deposits underlie the 20th century turf (the terreplein) and bitumen (along the terrace). Archaeological testing suggests these deposits are largely intact, although the installation of several services in the 20th century is expected to have impacted the integrity of these deposits.

Salvage excavation within several rooms of the barracks (Rooms B4, B5, B6/B7 and B14) suggests a good preservation of subfloor deposits there. There is a **high** potential for subfloor deposits in the three rooms currently serving as the Fort Denison museum (Rooms

B9, B10 and B11). The floorboards in these rooms were replaced prior to the 1990s although subfloor deposits are expected to survive beneath these. There is a **low to moderate** potential for subfloor deposits preserved in several rooms that have undergone significant 20th century remodelling, including the addition of concrete flooring (Rooms B2/B3, W1, W2 and W3) and conversion of rooms into public restrooms (Rooms B1 and B15).

There is **nil to low** potential for archaeological remains pre-dating the quarrying of Fort Denison (i.e. prior to 1840). This includes any evidence of the c.1840 'prisoner boxes', weatherboard kitchen, as well as the earliest British occupation of the island. There is also **nil to low** potential for archaeological evidence related to the 20th century slipway and yard. Although archaeological evidence may remain intact here, the resource of these constructions is assessed as not meeting the threshold for local or state significance.

There is **moderate** potential for maritime archaeology on the northern side of the island with potential for objects to have been deliberately or accidentally lost from the wharf or the original sea steps.

Table 3 Archaeological potential

Phase	Potential remains	Integrity	Archaeological potential
c1788–1840 Rock Island/Pinchgut			
c1788–96	<ul style="list-style-type: none"> Gibbet/open air gaol 	Archaeological remains pre-dating the construction of the battery were very likely destroyed during the quarrying and excavation of the island in the 1840s.	Nil to low
1840	<ul style="list-style-type: none"> Prisoner boxes Weatherboard kitchen, boiler and water tanks 		
The terrace			
1840–62	<ul style="list-style-type: none"> Original levelling fills/surfaces Occupational deposits 	The results of test excavations along the terrace suggest up to 1 m of fill is preserved here, although these deposits are significantly disturbed by the installation of various 20 th century services. Testing revealed no evidence of early (1840–62) occupation deposits.	Low to moderate
1862–1923	<ul style="list-style-type: none"> Garden features (including garden beds, edging, paths) Levelling fills 		
1901	<ul style="list-style-type: none"> Wharf 	Deposits abutting the north and west seawalls have undergone significant damage owing to wave action.	
Post 1923	<ul style="list-style-type: none"> Bitumen surfaces Retaining walls 		
The battery, terreplein and bastion			
1840–62	<ul style="list-style-type: none"> Original levelling fills/surfaces Cut rock water tank Occupation deposits Subsurface deposits including, former gun races, emplacements, drains, garden beds Original masonry 	Results of testing suggests the battery deposits along the terreplein are largely undisturbed, despite 20 th century landscaping. Up to 700 mm of stratified fills were preserved in some areas, including several early occupation fills dating to c.1842–56/7, and 1858–62.	Moderate to high
1862–1923	<ul style="list-style-type: none"> Garden features (garden beds, edging, paths, etc.) 	Detailed analysis of the battery suggests the preservation of both remnant 1840s masonry, and	

Phase	Potential remains	Integrity	Archaeological potential
Post 1923	<ul style="list-style-type: none"> Introduced soil/turf 	later 1856–62 fabric. Several gun race ‘ghosts’ are visible at the modern surface level. Additional gun races remain buried under post-1923 fills.	
The barracks			
1856–present	<ul style="list-style-type: none"> Original fabric (including walls, joinery, fireplaces) Original masonry Underfloor deposits 	Salvage excavations suggest underfloor deposits were largely intact, with the exception of Room 14 (disturbed during the installation of a generator in 1926/7). Approximately 50% of archaeological deposits within the barracks were removed during excavation.	Low to moderate / moderate to high
Post 1901	<ul style="list-style-type: none"> Various alterations to internal / external fabric (partitions between rooms, cement floors replacing floorboards, sandstone repairs) 	Much of the internal fabric was replaced in the 20 th century; however, subfloor deposits may be expected in the rooms not excavated.	
Martello tower			
1856–58	<ul style="list-style-type: none"> Original fabric and masonry 	Original interior and exterior fabric and fitting largely intact. Some damage to the Seysell asphalt flooring in the magazine. Possible earlier flooring/deposits under asphalt flooring.	Moderate to high
Loophole chambers (West Room and Tide Gauge Room)			
1856–58	<ul style="list-style-type: none"> Original fabric and masonry Underfloor deposits 	The Tide Gauge Room was largely rebuilt in 1910. Major building works were undertaken in the West Room in the 1970s and 80s which would have impacted on underfloor deposits.	Low to moderate
Slipway and slip yard			
1917	<ul style="list-style-type: none"> Original masonry 	Boat slips removed in c.1944, and gun position converted to barbecue. Original sandstone work preserved; however, while archaeological evidence may remain intact here, the resource is assessed as not meeting the threshold for local or state significance.	Nil to low

3.4 Condition of elements

The condition of elements, as assessed in 2016 and 2018, is included in the assessment of significance, Section 5, Table 4

3.5 Views

This section identifies significant views and vistas to and from the site and views within the site.

While Fort Denison is the only remaining intact fortification of the inner harbour defence scheme of the 1840s to 1860s, views linking these sites have survived (**Figure 78**).

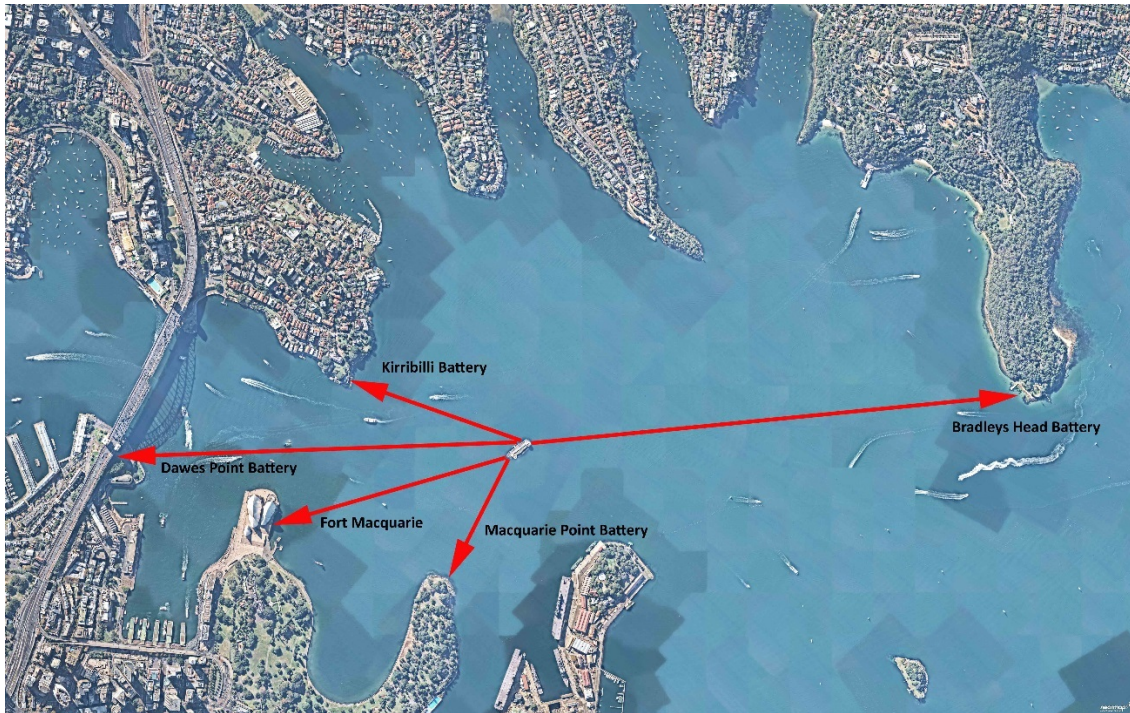


Figure 78: View from Fort Denison to sites of Barney's Inner Harbour Defence scheme (OEH, 2019)

The field of fire of the Fort Denison guns in which the guns would engage with an enemy warship is intact (**Figure 79**). This includes the 360-degree view from the top of the Martello tower, the 180-degree view from the bastion and the 90-degree view from the battery.



Figure 79: View of the Fort Denison field of fire (SixMaps, 2019)

The view linking the Fort Denison One O’Clock Gun to the Observatory was lost following construction of the Sydney Opera House (**Figure 80**).



Figure 80: View to the Observatory (OEH, 2019)

The forecourt offers exceptional views of the city with the city skyline, the Sydney Opera House and the Sydney Harbour Bridge as the key features (**Figure 81**). The southern end of the battery provides superior views of Farm Cove, the Sydney Opera House and the city skyline. These views are of significance to the cultural tourism phase of the island’s history.



Figure 81: View of the Sydney Opera House and Sydney Harbour Bridge (OEH, 2017)

Within the fort the following views are significant in visually interpreting the elements of historical, architectural and functional significance (**Figure 82**):

- The view from the wharf landing capturing the face of the barracks building with the Martello tower behind and archway entrance to the battery.
- The view from the Martello tower to the battery and bastion.
- The view from the battery and bastion to the Martello tower.

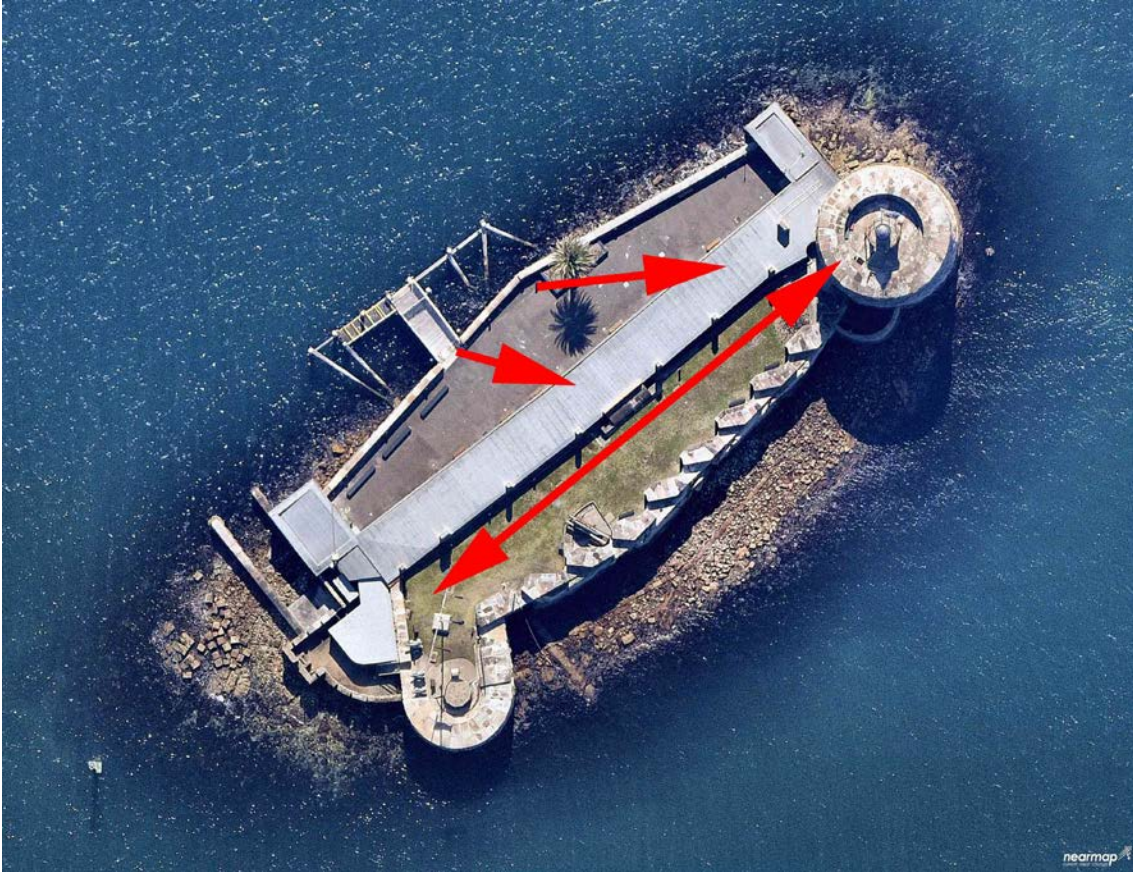


Figure 82: Internal views (Nearmap, 2019)

4 Comparative analysis

A comparative analysis compares specific elements of a place with other similar places to assist in determining the relative values of a place, particularly the rarity of an item. This analysis compares elements of Fort Denison and its associations with other sites, namely Martello towers across the world, colonial fortifications in Australia, islands of Sydney Harbour, places of convict confinement, punishment and labour, sites associated with Lt-Col George Barney, early Australian tide gauges, time guns and colonial-era ordnance.

4.1 Martello towers across the world

A total of 189 Martello towers were built throughout the world. Of all these towers only 106 still existed in 1972. By then many had been greatly compromised by adaptation, modification or incorporation into developing settlement.²⁴¹

The Martello tower at Fort Denison is the only one ever built in Australia.

Fort Denison is one of only three that remain of the nine constructed in the southern hemisphere; three were built in South Africa and five in Mauritius. One tower survives in each country.

On an international level it was the last tower completed, contemporary towers being:

- Pembroke Dock, Wales – two towers constructed 1848–1851
- Brehon Tower, Guernsey – while not strictly a Martello tower it represented the last in the evolution of Martello-type towers. It was constructed in 1856–57 and had three 68-pounders and two 10-inch shell guns.²⁴²

Although the standard British design of the 1840s had evolved considerably since adoption, the Fort Denison tower is much closer in form to those built in the early 1800s than those constructed in Britain in the 1840s. The provision of a supporting open gun battery is known elsewhere but the incorporation of the tower into an open battery is rare and possibly unique.

Fort Denison is generally close to the ‘classic’ form of the Martello tower. It is circular, within the usual range of dimensions for such structures with vaulted chambers and a single elevated entrance, though its position in relation to the barracks and open battery make this less apparent.

Island towers are unusual but known elsewhere. The other unusual feature is the lack of a central column in the gun room. Most Martello towers sacrificed internal space for the reassurance of a strong central column supporting the roof of the barracks, but its exclusion allowed the installation of the internal gun room.

4.2 Colonial fortifications in Australia

Fort Denison is the most intact surviving example of Denison’s inner harbour defence scheme. Fort Macquarie was demolished while Bradleys Head, Dawes Point Battery, Kirribilli and Point Macquarie have been greatly modified. The Bradleys Head Forts and Dawes Point Battery remains are listed on the NSW State Heritage Register.

Fort Denison is the only fortification in Australia including a Martello tower and the only site retaining smoothbore ordnance in situ on original carriages.

²⁴¹ NPWS 1999.

²⁴² https://en.wikipedia.org/wiki/Br%C3%A9hon_Tower, accessed 12 September 2017.

It is the only fortification constructed on an island in Sydney Harbour and with Bare Island in Botany Bay is one of only two forts constructed on an island in New South Wales. Bare Island Fort is also a place of state heritage significance.

4.3 Islands of Sydney Harbour

Muddawahnyuh is one of 13 islands within Sydney Harbour and the Parramatta River, however only eight remain as actual islands. Apart from Muddawahnyuh, the other seven islands are Goat, Shark, Clark, Rodd, Cockatoo, Spectacle and Snapper islands. Berry, Garden, Bennelong, Glebe and Darling islands have been connected to the mainland with infill development. Of these, Goat Island is also listed on the NSW State Heritage Register, while Cockatoo Island is listed on the National Heritage List with parts of the island inscribed on the World Heritage List with sites that form part of the Australian Convict Sites listing.

4.4 Places of convict confinement, punishment and labour

Pinchgut Island was the only island used for the confinement and punishment of convicts during the establishment years of the Port Jackson colony. The island is one of only two known islands in Sydney Harbour where a convict was confined in an outdoors location on short rations as a method of punishment, the other example being Charles Anderson on Goat Island for several weeks only in the 1830s.

Gibbetting is the use of a gallows-type structure to display the bodies of executed criminals as a warning and deterrent to others and was a common law English punishment. It was regarded as a terrible punishment – being not only a public spectacle but the denial of a proper Christian burial – and was meant to serve as a warning to others.²⁴³ Gibbetting was used in New South Wales as early as 1795 during a punitive expedition against Aboriginal people²⁴⁴ and was part of standard instructions to soldiers sent to hunt and kill Aboriginal people until the Appin massacre in 1816 and probably later.²⁴⁵ In New South Wales gibbetting was used as late as 1831 at Goulburn Plains where the sentence was placed on two convicted murderers.²⁴⁶ Gibbetting was also used in Tasmania where bodies were displayed on Hunter's Island, Hobart until 1816 when the bodies started to create offence and were relocated to nearby Queenborough.²⁴⁷ The practice was last used in Scotland in 1810 and England in 1832. The last recorded gibbetting in a British colony occurred in Tasmania in 1837.

Pinchgut was one of three islands which hosted an iron gang, the other two being Goat Island from 1833–1839 and Cockatoo Island from 1839. Iron gangs were used across New South Wales to carry out major public works in remote locations including the western road over the Blue Mountains, the Great North Road and Great South Road (Towrang Convict Stockade).

Both Pinchgut and Goat Island were used as places of secondary punishment. Other sites to which convicts could be sent after committing a second offence after arrival in New South Wales included Port Macquarie, Norfolk Island and Van Diemen's Land.

²⁴³ Grace Karskens, personal communication, 2017.

²⁴⁴ *The Bushranger in Peril*, *The Canberra Times*, 18 November 1995, p.57.

²⁴⁵ Karskens.

²⁴⁶ *Supreme Court*, *The Sydney Gazette and New South Wales Advertiser*, 8 November 1831, p.3.

²⁴⁷ *The Hobart Town Gazette and Southern Reporter*, 8 June 1816, p.1.

4.5 Sites associated with Lt-Col George Barney

During his career as Commanding Royal Engineer and Colonial Engineer, Colonel Barney oversaw the construction of numerous military and civil buildings and structures. Surviving examples include the fortifications at Bradleys Head, Dawes Point and Kirribilli Point, the incomplete fortification at South Head, the original semicircular Quay, new Government House, Victoria barracks and the first Newcastle breakwater. Barney also oversaw the completion of the Powder Magazine on Goat Island and the separation of Goat Island from the Water Police station on the tip of the island. Barney was associated in other capacities with the Garrison Church (as a member of the building committee) and Admiralty House (as owner from 1856 to 1860).

4.6 Early tide gauges in Australia

Tide levels have been recorded on Fort Denison continuously since 1866, the longest continuously recorded site in Australia. Fort Denison is the earliest site still in use. Other early tide gauge sites include Fremantle (1873), Port Adelaide (1880), Port Pirie (1883) and Newcastle (1889).²⁴⁸

The original gauge was a Smalleys chart recorder. It was subsequently replaced with a Russels gauge in 1872, and a Harrisons Gauge in 1914. A Vetac acoustic sensor was installed in 1996 providing digital one-minute records and this was upgraded to a SeaRanger acoustic sensor in 2007.²⁴⁹

4.7 Time guns

A noon day gun was fired from Fort Macquarie from June 1858 following construction of the time ball at the Observatory in the same year. The time changed to one o'clock from 1 September 1858 and was then transferred to Dawes Point.²⁵⁰ The one o'clock gun was relocated to Fort Denison in 1906. The Fort Denison one o'clock gun is the earliest gun used for this purpose in Australia which still undertakes the same role. It is the only gun now fired daily in New South Wales to continue this tradition.

Time guns were fired at other Australian ports associated with the dropping of a time ball at a nearby observatory or customs house, including Hobart Town from 1863 until 1923, Fort Scratchley in Newcastle, Fremantle Roundhouse from 1900 and Perth Observatory from 1902. A one o'clock gun was also fired for a short time in Wollongong from the late 1870s. The firing of the Fremantle gun recommenced in 1998.

It is one of the longest continually fired time guns anywhere in the world. A noon gun has been fired at Signal Hill in Cape Town since 1806. The firing of the one o'clock gun at Edinburgh Castle has been a famous tradition since 1861; however, a modern artillery piece is now used for this purpose.

4.8 Ordnance

Elsewhere within New South Wales, 32-pounder gun barrels are found at two other locations and are part of council memorials. Two 32-pounder 56 cwt gun barrels are found in

²⁴⁸ *Tide Gauge Histories*, Manly Hydraulics Laboratory, October 2013, p.3.

²⁴⁹ *Tide Gauge Histories*, p.12.

²⁵⁰ Dawes point tar ra CMP Appendix A: An Illustrated History, January 2011, p.11.

Parramatta and two 32-pounder 50 cwt barrels are located at Richmond, none on original carriages.

The 8-inch shell gun is the only one of its type in New South Wales.

Two 12-pdr brass howitzers are in storage in Kurnell, one is on a replica carriage in Manly and one is on loan to the Royal Australian Artillery Historical Society from Fort Denison.

5 Heritage significance

5.1 Introduction

Fort Denison is a place of international, national, state and local significance. The purpose of this section is to explore the reasons a place is significant and to determine the level of significance whether at a state or local level.

5.2 Assessment of significance against state criteria

The State Heritage Register is established under Part 3A of the Heritage Act (as amended in 1998) for listing of items of environmental heritage, those places, buildings, works, relics, moveable objects, and precincts, of state or local heritage significance (section 4, *Heritage Act 1977*), which are of state heritage significance, in relation to the historical, scientific cultural, social, archaeological, architectural, natural or aesthetic value of the item (section 4A(1), Heritage Act).

The following criteria are used within New South Wales to assess the heritage significance of an item:

Criterion (a): An item is important in the course, or pattern, of NSW's cultural or natural history or the cultural or natural history of the local area (historical significance).

Criterion (b): An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history or the cultural or natural history of the local area (historical association).

Criterion (c): An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW or the local area (aesthetic significance).

Criterion (d): An item has strong or special association with a particular community or cultural group in NSW or the local area for social, cultural or spiritual reasons (social significance).

Criterion (e): An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history or the cultural or natural history of the local area (research potential).

Criterion (f): An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history or the cultural or natural history of the local area (rarity).

Criterion (g): An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments, or a

class of the local area's cultural or natural places; or cultural or natural environments (representativeness).²⁵¹

This assessment will evaluate the significance of Fort Denison against each criterion and determine the level of significance.

Criterion (a): An item is important in the course, or pattern, of NSW's cultural or natural history or the cultural or natural history of the local area (historical significance)

Fort Denison is of national significance as tangible evidence of the evolution of fortification design in Australia, which reflected the international technological development of ordnance and warships.

Fort Denison is of national significance for the place's ability to provide insight into the nature of convict life and punishment during the early years of the colony, the use of convict iron gangs to carry out major public works and the human response to being forced to carry out hard labour in poor conditions – escape.

Fort Denison is of state significance as a key element of Denison and Barney's inner harbour defence strategy while also providing evidence of the short-lived and highly criticised scheme.

The long continual operation of a tide gauge on the fort and the firing of the one o'clock gun from 1901 until 1942 for functional reasons are of state significance.

The fort is of local significance as an early and enduring historical Sydney tourist attraction.

The known and potential archaeological remains of Fort Denison are expected to relate to the construction of early colonial defensive works reflecting the concerns faced by the colony at this time, as well as to the mid and late 19th century military occupation of the island. The analysis of artefacts from subfloor deposits in the barracks would provide insight into the standards of military accommodation during the mid-19th century, particularly regarding rank delineation. These historic values are considered to be at a state level.

Criterion (b): An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history or the cultural or natural history of the local area (historical association)

Fort Denison is of state significance for its strong association with the life or works of the following people of importance in NSW's cultural history:

The Aboriginal people of Sydney Harbour

Until 1796 the island was visited regularly by the local Aboriginal people. Although the purpose of these visits was not recorded it was described as a place of resort which suggests a specific purpose.

Convicts

The island is of state significance for its association with the earliest convicts of Port Jackson and made all the more enduring by the naming of the island as 'Pinchgut'. The island is also associated with the convict labour force of the 1840's.

Lieutenant-Colonel George Barney

George Barney was the Commanding Royal Engineer and Colonial Engineer from 1835–43, Superintendent of North Australia 1846–47, Chief Commissioner Crown Lands 1849–55, Member Legislative Council 1851–56 and Surveyor General 1855–59. Barney was responsible for overseeing the design and construction of numerous military and civil works,

²⁵¹ NSW Heritage Office, *Assessing Heritage Significance*, 2001, p.9.

many of which survive and are of heritage significance. Barney initiated the inner harbour defence scheme of which Fort Denison was a key element and was a continuing influence on the choice of the island as a defensive site. He designed and oversaw both stages of fortification construction on the island over 17 years.

Sir William Denison

Governor Denison was appointed as Governor of New South Wales in 1854. During his seven-year term he was responsible for adopting the inner harbour defence strategy with Fort Denison as the focal point, transitioning executive power to the new NSW Parliament, opening the colony's first railway, closing the Norfolk Island penal colony and re-settling the Pitcairn Islanders there. The fort was named in his honour during Denison's absence from the colony.

Royal Artillery, NSW Volunteer Artillery and NSW Naval Brigade

The fort was occupied by successive imperial and colonial military units over 43 years for the purpose of defending the colony from sea-borne attack and for gun training.

Criterion (c): An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW or the local area (aesthetic significance)

Fort Denison is of state significance for its landmark qualities, appearing in numerous early historical paintings and photographs and remains an important visual landmark in the middle of the inner harbour. The fort demonstrates an exceptional level of technical achievement in relation to the fine stonework. The visual impact of the fort is a combination of the strong vertical mass of the Martello tower and the equally strong horizontal lines of the low barrack and battery buildings.

Criterion (d): An item has strong or special association with a particular community or cultural group in NSW or the local area for social, cultural or spiritual reasons (social significance)

Fort Denison has a strong social association with the families and descendants of the lightkeepers and caretakers who occupied the place from the 1870s until the 1990s.

Although no direct public consultation has been conducted for this assessment, the social value and significance attached to the archaeological remains of Fort Denison may be quite accurately assessed with regards to the popularity of the island as a tourist destination. Archaeological remains from Fort Denison are likely to have an association with local community groups who have an interest in the history of early Sydney, particularly with regards to 19th century military and naval history and harbour defensive works. These values are significant at a state level.

Criterion (e): An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history or the cultural or natural history of the local area (research potential)

Fort Denison is of state significance for the potential to yield further physical or historical evidence of the use of convict iron gangs, mid-19th century stonework construction and occupation of the site by the Royal Artillery, NSW Volunteer Artillery and NSW Naval Brigade.

The excavated remains from previous excavations on the island range from low to high significance. Excavated in situ remains including bedrock, crushed sandstone levelling fills, gun races and drains, former surfaces, sections of the terreplein and ash deposits within the battery are of high significance. Together with the underfloor deposits from barracks rooms B4, B5, B6/7 and B14 they relate to the occupation and use of the island for defence purposes. In situ excavated features such as the path, stoneware gully traps on the terrace

and the former sandstone garden beds on the battery, and associated artefacts relate to the SHT and MSB occupation of the island and are of moderate significance.²⁵²

Potential archaeological remains within Fort Denison include:

- evidence of original masonry and fabric, fittings and construction associated with the 'convict shaped rock' battery (1840–42), the casemated barracks and tower, bastion (1856–58), loophole chambers and terrace (1858–62)
- subfloor deposits within (unexcavated) rooms of the barracks
- occupation deposits (particularly within the terreplein) dating to the early use of the fort (c.1840–62)
- evidence for changes in design particularly to the barracks, although predominantly dating to the 20th century
- evidence for (20th century) landscaping in the terreplein and terraces.

There is moderate to high potential for the archaeological resource at Fort Denison to provide information about its construction and use that is unavailable from other resources. The ability of a site to reflect knowledge that no other resource can is dependent upon the research questions and the methodology employed to investigate the archaeological resource.

Fort Denison has the potential to yield archaeological information which can address a range of questions, many of which have been addressed in previous archaeological excavations, including:

- The nature and design techniques of masonry construction, including the effect of later additions on the original built fabric.
- The extent of early (c.1840–62) occupation fills on the terreplein.
- The impact of 20th century activities (particularly the installation of services) on the known and potential 19th century deposits.
- Whether the analysis of artefact assemblages demonstrates any evidence for the shifting use of the barracks (as a military institution and in the 20th century as a more domestic residence). Can the material culture provide information on the function of spaces?
- Whether the artefact assemblage reveals any status or rank delineation?
- What the archaeological remains reveal about the occupants of Fort Denison compared with contemporary domestic and non-domestic assemblages from the mid to late 19th century?

These values are significant at a state level.

Criterion (f): An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history or the cultural or natural history of the local area (rarity)

Fort Denison is of national significance as it contains the only Martello tower ever built in Australia. It is significant on an international level as the last tower completed and one of the most intact structures. The combination of Martello tower, gun battery and barracks building occupying an entire island is unique. The fort's open battery is rare within New South Wales.

The collection of original ordnance is unique within New South Wales and is of state significance. Thirty-two pounder guns are rare within New South Wales but the three in the tower are the only guns of their type in New South Wales retained in their original location on

²⁵² Mider, p. 14.

original garrison carriages. The 8-inch shell gun is the only one of its type in New South Wales.

The use of the island to confine and punish offending convicts, followed by use of a gibbet on the island to display the rotting body of a convicted murderer as a strategy to maintain law and order among the convict population, was rare within New South Wales and is of state significance.

The Fort Denison one o'clock gun is of state significance as the earliest gun used for this purpose of marking time which still undertakes the same role. It is the only gun now fired daily in New South Wales to continue this tradition. It may be one of the longest continually fired time guns anywhere in the world.

The Fort Denison tide gauge station is of state significance as tide levels have been recorded on Fort Denison continuously since 1866, the longest continuously recorded site in Australia. Fort Denison contains the earliest tide gauge site still in use and is of national significance.

The fort's moveable heritage collection includes items related directly to the operation of the guns and storage of gunpowder cartridges and is unique at a national level.

The known and potential buried archaeological remains and evidence of tooled stone surfaces in addition to the masonry fort construction, particularly the Martello tower, are considered rare and significant to the cultural history of New South Wales at a state level. Archaeological remains dating to the 20th century use of the site are not considered to be a rare resource.

Criterion (g): An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments, or a class of the local area's cultural or natural places; or cultural or natural environments (representativeness)

Fort Denison is significant at a national level for its demonstration of two principal characteristics of fortification design which dominated the previous century of defensive design around the world: the Martello tower and the open battery. Fort Denison is representative of the earliest form of Martello tower. It is circular, within the usual range of dimensions for such structures with vaulted chambers and a single elevated entrance, though its position in relation to the barracks and open battery make this less apparent. The open battery, consisting of a row of guns on a terreplein protected only by a parapet, was the most common fortification type in the 18th and first half of the 19th centuries.

The casemated barracks building, detailing of fittings and segregation of officers from enlisted men are representative of 19th century British Imperial army barracks.

The potential archaeological remains within Fort Denison are considered to be representative of 19th century harbour defensive works. The known and potential subfloor deposits within the barracks (comprising personal artefacts, artefacts relating to consumption, etc.) are reflective of the 'institutional' military occupation of the island.

Modification of the fort by the SHT and MSB caretakers to create a more domestic setting for them and their families is of local significance.

5.3 Statement of heritage significance

Fort Denison is of national significance as an exceptionally fine and intact example of a 19th century defence fortification that is unique within Australia. Located in Sydney Harbour, in the vicinity of the Sydney Opera House and the Sydney Harbour Bridge, Fort Denison is a landmark, a sandstone structure mounted on a carved sandstone platform, entirely surrounded by the waters of one of the finest harbours in the world.

Fort Denison is the only island site entirely covered with a fortification within Sydney Harbour and largely retains the integrity of its completed 1862 form. In an international context, the combination of a Martello tower and associated barracks is unusual and rare. The fort, built entirely of local sandstone, demonstrates the evolution from an island to convict shaped rock battery to a completed fort. The Martello tower on Fort Denison is unique as a European styled coastal fort constructed in Australia. It is of international significance as one of only three towers in the southern hemisphere that survive intact, and forms part of a worldwide group of similarly styled and dated European coastal fort towers built during this period. The tower is also of international significance for the integrity of its original casemated ordnance and sidearms.

Fort Denison is associated with several phases of Australian history. As an impressive natural rock island, it was visited regularly by local Aboriginal people, and was first used by European settlers as a place for incarceration of convicts. The island was then modified for defensive use firstly as a battery and then as a more complete fort. As a fort it demonstrates the administration and politics of the British Empire and the need for defensive structures in the colonies during the 19th century, as well as the Board of Ordnance standards and status delineation of military accommodation in the mid-19th century. From the 1890s the island and fort took on a maritime role, as a tide station and as part of the Sydney Harbour navigation system, uses which continue today.

Fort Denison is of state significance as the location of the State's principal tide gauge since the 1870s, when the first gauge was installed at the south-west end of the island, and as an integral part of the Sydney Harbour navigation system from 1858, when the first navigational light was installed. The island was the location for the time gun (part of the system for setting maritime chronometers for longitude measurement) from 1906 to 1942, re-introduced and maintained as a tourist attraction in 1986. The occupation of the island by the Sydney Harbour Trust and its successor the Maritime Services Board was incidental to these activities.

Fort Denison's defensive fortification, erected in 1840–62 is a direct reflection of the concerns of the British settlement in Sydney during the mid-19th century. There is a high potential for archaeological remains associated with both the construction of the fort, as well as the mid and late 19th century military occupation of the island. The existing built fabric presents a rare example of colonial harbour fortification and is representative of the early character of the colony, specifically the employment of convict labour. The buried archaeological remains are reflective of the military occupation of the island by artillerists and their families. These archaeological features have the potential, through archaeological analysis, to further our understanding of this phase of the development of Sydney and to contribute to our understanding of early colonial defensive works. Archaeological remains related to the 19th century construction and military use of the island are considered to be of state heritage significance.

Fort Denison is of local significance as a tourist attraction, recognised for many years by the people of Sydney as an historic fortification that remains an enduring feature in a changing harbour context. The very nature of its massive sandstone construction, combined with its isolation and comparative inaccessibility, adds to its mystique and its landmark status within Sydney Harbour.

5.4 Significant fabric, features and artefacts

Dr James Kerr's original assessment of the significant elements of Fort Denison ('Tabulation of elements and qualities at Fort Denison of considerable or exceptional significance',

September 1986)²⁵³ used only two levels of significance: considerable or exceptional (no distinction being made between the two) and minor (or some). Elements that were by implication of little or no significance, or intrusive, were not identified. The 1999 NPWS conservation management plan adopted a different terminology for the levels of significance: primary, contributory, and little or no significance. Intrusive elements were not identified, although the recommendation that elements of little or no significance be removed implies that these were considered intrusive.

Kerr's assessments of elemental significance derived from his assessment of the overall significance of the place primarily as a fort; the only elements relating to other uses of Fort Denison that appear in the table of elements of considerable or exceptional significance are the fixing points for the fixed light and flagpole on the tower terreplein, and the early tide gauge machine. The 1999 NPWS assessment, however, gave equal prominence to the significance of the place as Sydney Harbour Trust and Maritime Services Board works, including the concrete light tower, slip yard and one o'clock gun position, listing these works (which Kerr regarded as being of only some significance) among the elements of primary significance. A number of the elements assessed by NPWS as being of contributory significance are not mentioned in the Kerr tables at all, and it is unclear why some of these elements such as 'later unsympathetic replacement stonework' were assessed as having contributory significance in the NPWS 1999 assessment. The grading of elements below clarifies these discrepancies in order to provide a sound basis for assessing the heritage impact of future works at the place. The detailed grading of elements uses the following definitions.

Table 4 Assessment of significance

Significance	Definition
Exceptional	This category comprises those elements that are critical to the primary significance of the place. These are essentially the elements relating to the construction and use of the place as a fort and military establishment from 1836 to 1881.
High	This category comprises those elements that are critical to the secondary aspects of the cultural significance of the place. These are mainly the elements relating to the navigational and scientific activities at the fort, which commenced during the military establishment and continued into the 20 th century.
Moderate	This category comprises those ancillary elements that contribute to the significance of the place, including reconstructed elements that retain valuable evidence of the original elements. Original elements in this category relate to the occupation of the site by the Sydney Harbour Trust and Maritime Services Board from 1901 to 1990.
Little/low	This category includes most of the recent alterations and additions made to accommodate changing requirements, where these are expedient and of marginal intrinsic worth. It also includes well-constructed replacement elements that bear some similarity to the original. These elements neither contribute to nor materially detract from the significance of the place.
Intrusive	This category includes those alterations and additions which actively detract from the significance of the place and includes fabric that in both materials and workmanship either poorly emulates or pays no regard to earlier fabric. This category also includes non-significant fabric which obscures or interferes with significant fabric or spaces, or contributes to the deterioration of significant fabric, for example much of the current commercial kitchen installation.

²⁵³ Kerr 1986, pp.49–51.

Gradings of significance for the major elements and spaces on Fort Denison are shown in **Figure 83**.

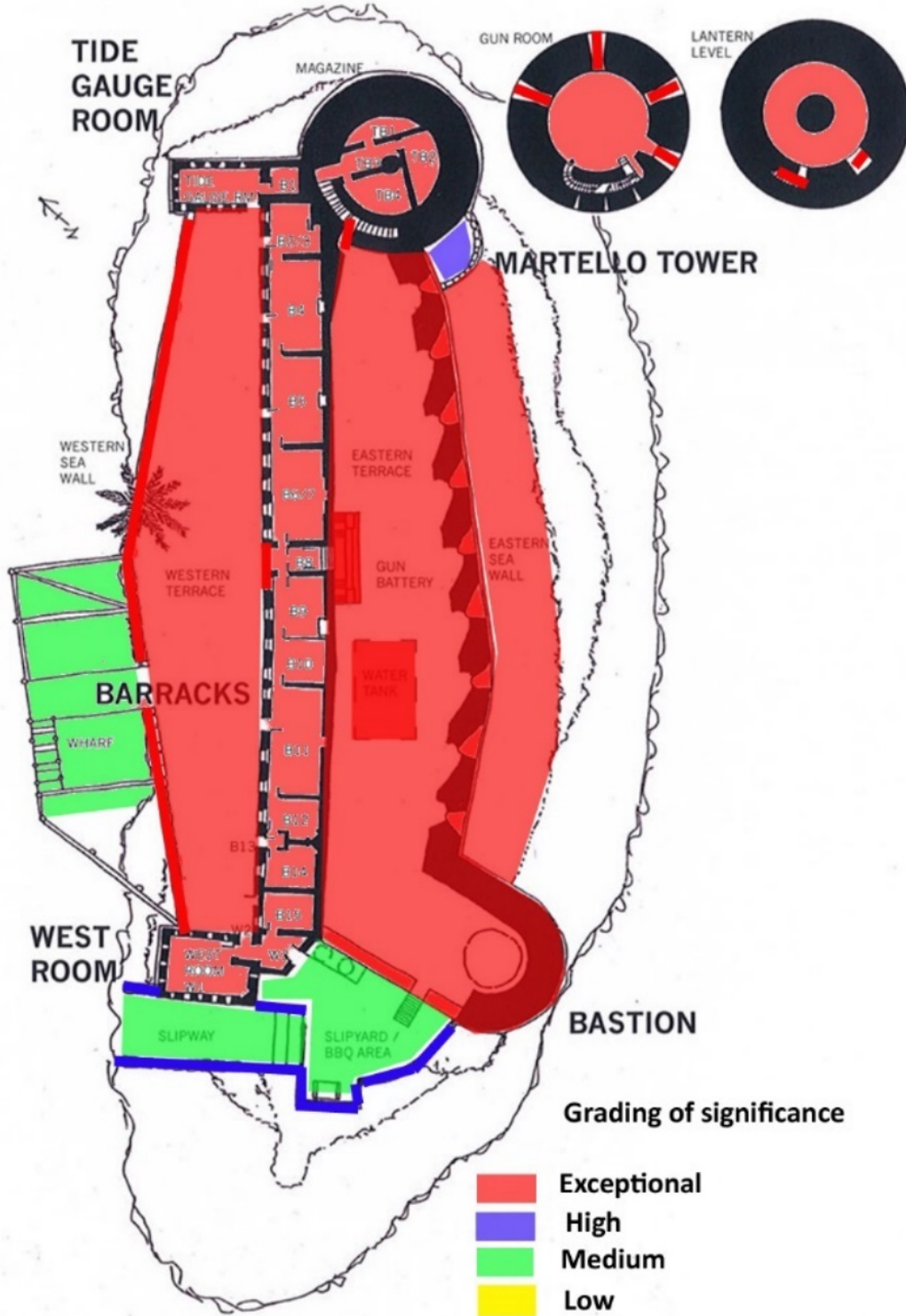


Figure 83: Gradings of significance for major elements and spaces on Fort Denison (OEH 2019).

5.4.1 Martello tower

Tower exterior		Date	Significance	Condition	Figure
Walls	Sandstone with granite joggles	1850s	Exceptional	Fair	79a
Embrasures	Sandstone	1850s	Exceptional	Good	79a
Retaining wall	Sandstone	1910s	High	Fair	
Loopholes	Stepped sandstone	1850s	Exceptional	Poor	
Door from battery	Timber-framed and braced, painted; reconstructed	1920s?	High	Good	79b
Windows	Refer to Gun room				
Roof	Refer to Tower terreplein				

Tower terreplein (Lantern level)		Date	Significance	Condition	Figure
Floor	Stone flags and drain	1850s	Exceptional	Fair	79e
Parapet	Sandstone with granite joggles	1850s	Exceptional	Fair	79e
Door from stairs	Timber-framed and braced, painted, half glazed	1920s?	High	Good	79b
Firing step	Sandstone	1850s	Exceptional	Fair	
Lantern	Concrete, sandstone	1910s	High	Fair	79e
Chimney	Iron and terracotta	1850s	Exceptional	Fair	79c
Gun fixtures	Wrought iron, concrete filled chase for gun race	1850s	Exceptional	Fair	79e
Navigation light and fixtures	Steel, painted	1850s–1920s	High	Good	89f

Room TB1	Magazine store	Date	Significance	Condition	Figure
Floor	Trinidad asphalt	1850s	Exceptional	Fair	80f
Walls	Sandstone, former limewash	1850s	Exceptional	Poor	80f
Ceiling	Sandstone, former limewash	1850s	Exceptional	Fair	80f
Door	Timber-framed and braced	1850s	Exceptional	Good	
Vents	Sandstone	1850s	Exceptional	Fair	
Contents	Refer to moveable items list				

Fort Denison Conservation Management Plan

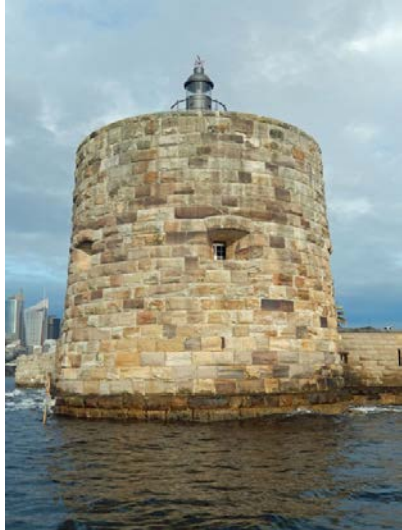
Room TB2	Magazine store	Date	Significance	Condition	Figure
Floor	Trinidad asphalt	1850s	Exceptional	Fair	80a
Walls	Sandstone, limewashed	1850s	Exceptional	Fair	80a
Ceiling	Sandstone, limewashed	1850s	Exceptional	Fair	80a
Door	Timber-framed and braced	1850s	Exceptional	Good	80a
Inscription	Engraved and painted	1850s	Exceptional	Good	80b
Markings	Barrel marks on floor	1860s– 1980s	Exceptional/ high	Fair	80a

Room TB3	Passage	Date	Significance	Condition	Figure
Floor	Trinidad asphalt	1850s	Exceptional	Fair	80c
Walls	Sandstone, former limewash	1850s	Exceptional	Fair	80c
Ceiling	Sandstone, limewashed	1850s	Exceptional	Fair	80c
Doors	Refer to Rooms TB1, TB2 and TB4				
Window	Timber-framed with lantern	1850s	Exceptional	Good	80f
Steps	Sandstone Concrete topping	1850s 1920s?	Exceptional Intrusive	Fair Good	80e
Handrail	Steel, painted	2000s	Little/low	Good	80e

Room TB4	Magazine store	Date	Significance	Condition	Figure
Floor	Trinidad asphalt	1850s	Exceptional	Fair	80d
Walls	Sandstone, part natural rock	1850s	Exceptional	Fair	80d
Vents	Sandstone	1850s	Exceptional	Fair	
Ceiling	Sandstone, limewashed	1850s	Exceptional	Fair	80d
Door	Timber-framed and braced	1850s	Exceptional	Good	80c
	Original lock, brass	1850s	Exceptional	Good	80d
	Painted label on door	1860s	Exceptional	Fair	80c
Window	Timber-framed with lantern	1850s	Exceptional	Good	80f
Contents	Refer to moveable items list				80d

Fort Denison Conservation Management Plan

Gun room	Casemate	Date	Significance	Condition	Figure
Floor	Stone flags	1850s	Exceptional	Fair	81b
Steps	Sandstone	1850s	Exceptional	Fair	81a
	Concrete topping	1920s?	Intrusive	Fair	
Walls	Sandstone, painted	1850s	Exceptional	Fair	81e
Ceiling	Sandstone, painted	1850s	Exceptional	Good	81e
Inscription	Engraved and painted	1850s	Exceptional	Good	81e
Door	Timber-framed and braced	1850s	Exceptional	Good	81b
Windows	Timber-framed casements	Before 1901	Moderate	Good	81e
Fireplace	Cast-iron	1850s	Exceptional	Good	81e
32-pounder guns	Iron 56 cwt guns (serial nos 70, 117, 121 and 135) and timber and iron garrison carriages	Before 1850s	Exceptional	Good	81e
Other contents	Refer to moveable items list				81e



(a) Martello tower from north



(b) External door to Martello tower (left) and door to basement rooms (centre)



(c) Parapet and chimney on tower terreplein



(d) Detail of original lock to door on Room TB4



(e) Tower terreplein and parapet, with lantern structure (left) and firing step



(f) Room TB1 looking east

Figure 84 Photographs of Fort Denison in 2016 (Orwell & Peter Phillips)



(a) Room TB2 looking north



(b) Detail of inscription in Room TB2



(c) Room TB3 looking west



(d) Room TB4 looking east



(e) Steps up from Room TB3



(f) Lantern window to Room TB4

Figure 85 Photographs of Fort Denison in 2016 (Orwell & Peter Phillips)



(a) Steps up to gun room



(b) Door from gun room to terreplein



(c) Tide Gauge Room exterior from north



(d) Tide Gauge Room looking north-west, showing tide gauges



(e) Gun room looking north, showing fireplace and inscription on dome



(f) Tide Gauge Room looking south-east to doors to terrace and Room B1

Figure 86 Photographs of Fort Denison in 2016 (Orwell & Peter Phillips)

5.4.2 Tide Gauge Room

Tide Gauge Room exterior		Date	Significance	Condition	Figure
Walls	Sandstone	1850s	Exceptional	Fair	81c
Loopholes	Stepped sandstone	1850s	Exceptional	Fair	81c
Door from terrace	Timber-framed and braced	1920s?	High	Poor	81f
Windows	Refer to interior				
Roof	Bituminous membrane	1990s?	Little/low	Good	81c

Tide Gauge Room interior		Date	Significance	Condition	Figure
Floor	Concrete	1910s	Intrusive	Fair	81d
	Quarry tiles	1970s?	Little/low	Fair	
Walls	Sandstone, south-east end	1850s	Exceptional	Fair	81f
	Sandstone, remainder	1910s	High	Poor	81d
	Sacrificial render	1990s	Little/low	Poor	81d
Loopholes	Sandstone, stepped	1850s	Exceptional	Good	
Ceiling	Timber joists and boards	1910s	High	Good	81f
Door	Timber-framed and braced	1910s?	High	Poor	81f
Windows	Timber-framed casements	1970s?	Moderate	Fair	81d
	Fixed glazing	1910s?	High	Fair	
Contents	Early tide gauge machine	1870s?	High	Good	81d

5.4.3 Terrace

		Date	Significance	Condition	Figure
Paving	Asphalt	1990s	Little/low	Fair	82a
Walls	Sandstone	1910s?	High	Fair	82b
Wharf	Timber-framed	1940s?	Moderate	Fair	82d
Steps	Stone (possibly under paving)	1850s	Exceptional	Unknown	
Fences	Timber paling	1990s?	Little/low	Fair	82d
Landscape	Palm tree	1910s	High	Good	82b
Garden bed	Stone edged	1980s?	Little/low	Good	82b
Bollard lights	Powder-coated steel	2017	Intrusive	Good	69



(a) Terrace looking north-east, showing the barracks and Martello tower beyond (2018)



(b) Terrace looking south-west, showing the barracks and palm tree (2018)



(c) Typical elevation of barracks outside Room B5 (2018)



(d) Wharf from the roof of the barracks, showing garbage handling (2016)



(e) Interior of Room B1 (2016)



(f) Iron shutter, barracks wall (2016)

Figure 87 Photographs of Fort Denison in 2016–18 (Orwell & Peter Phillips)

5.4.4 Barracks

Barracks exterior		Date	Significance	Condition	Figure
Walls	Sandstone	1850s	Exceptional	Fair	82c
	Indent repairs	1960s– 1990s	Moderate	Fair	
Windows	Timber-framed, double hung	1850s	Exceptional	Fair	82c
	Repairs to windows	1990s	Moderate	Good	
Doors	Timber-framed and braced	1850s	Exceptional	Fair	82c
	Repairs and hardware	1990s	Little/low	Fair	
Wall vents	Brass	1990s	Moderate	Fair	82c
Shutter	Wrought iron	1850s	Exceptional	Fair	82f
Shutter fixings	Wrought iron	1850s	Exceptional	Fair	82c
Roof	Bituminous membrane	1990s	Little/low	Good	88a
Chimneys	Brick, painted	1850s	Exceptional	Good	88a
	Replaced chimneys and pots	2000	Moderate	Good	
	Brass vents on chimneys	1990s	Little/low	Good	

Room B1	Accessible WC	Date	Significance	Condition	Figure
Floor	Concrete	1920s?	Little/low	Unknown	
	Quarry tiles	1980s	Little/low	Fair	
Skirting	Coved tile	1980s	Little/low	Fair	
Walls	Sandstone	1850s	Exceptional	Fair	82e
	Render	1920s?	Little/low	Fair	
	Tiling on false walls	1980s	Little/low	Fair	
Ceiling	Sandstone, former limewash	1850s	Exceptional	Fair	82e
Door	Timber flush	1980s	Little/low	Fair	81f
Fit-out	WC, grab rails, handbasin	1990s	Little/low	Good	82e

Room B2/B3	Former gunners' kitchen	Date	Significance	Condition	Figure
Floor	Concrete, concrete hob	2000	Little/low	Good	83a
Walls	Sandstone	1850s	Exceptional	Poor	83a
	Lime-based render	1990s	Little/low	Poor	
	Brick infilled openings	1940s	Intrusive	Fair	83b
Ceiling	Sandstone vault on iron beam	1850s	Exceptional	Poor	83a
Internal door to B4	Timber-framed and boarded	1900s	High	Fair	83c
	Repairs and hardware	1990s	Moderate	Fair	
Windows	Timber-framed, double hung	1850s	Exceptional	Good	
	Sill boards and repairs to windows	1990s	Moderate	Good	

Fort Denison Conservation Management Plan

Room B2/B3	Former gunners' kitchen	Date	Significance	Condition	Figure
Fit-out	Cast-iron manifold and ventilation hatch.	1850s	Exceptional	Poor/Fair	

Room B4	Former other ranks' quarters	Date	Significance	Condition	Figure
Floor	Compressed fibre cement	2000	Intrusive	Fair	83c
Walls	Sandstone	1850s	Exceptional	Poor	83c
	Sacrificial render	1990s	Little/low	Poor	83d
	Brick infill	1940s?	Intrusive	Fair	83c
Ceiling	Sandstone vault on iron beams	1850s	Exceptional	Fair	83d
Internal doors	Timber ledged/framed & boarded	1900s	High	Fair	83d
	Repairs and hardware	1990s	Moderate	Fair	
Windows	Timber-framed, double hung	1850s	Exceptional	Fair	84a
	Sill boards and repairs to windows	1990s	Moderate	Fair	
Fireplace	Stone chimneybreast and hearth	1850s	Exceptional	Poor	83e
	Brick hearth and surround	1940s	Medium	Poor	
	Cast-iron stove	1940s	Medium	Poor	

Room B5	Former other ranks' quarters	Date	Significance	Condition	Figure
Floor	Timber boards (re-laid)	1850s	Exceptional	Poor	83f
	Copper sheet patches	1960s?	Little/low	Fair	84e
	Brass gratings and balustrades	1990s	Little/low	Fair	83h
Walls	Natural rock and sandstone	1850s	Exceptional	Fair	83f
	Sacrificial render	1990s?	Little/low	Poor	
	Pockets for equipment racks	1850s	Exceptional	Fair	
Ceiling	Sandstone vault on iron beam	1850s	Exceptional	Fair	83h
Internal doors	Timber-framed and braced	1900s	High	Fair	83g
	Repairs and hardware	1990s	Moderate	Fair	
Windows	Timber-framed, double hung	1850s	Exceptional	Good	
	Sill boards and repairs to windows	1990s	Moderate	Fair	
Fireplace	Stone chimneybreast and hearth	1850s	Exceptional	Fair	83h
	Brick hearth	1900s?	Moderate	Good	
	Cast-iron grate	1900s?	Moderate	Good	

Room B6/B7	Former other ranks' quarters	Date	Significance	Condition	Figure
Floor	Timber boards (re-laid)	1850s?	Exceptional	Poor	84c
	Brass edge grating	1990s?	Little/low	Fair	84d
Walls	Natural rock and sandstone	1850s	Exceptional	Poor	84d
	Sacrificial render	1990s?	Little/low	Poor	84c
	Subfloor vents in walls	1850s	Exceptional	Poor	84d
	Pockets and equipment racks	1850s	Exceptional	Fair	84d
Ceiling	Sandstone vault on iron beam	1850s	Exceptional	Fair	84d
Doors	Timber-framed and braced	1850s	Exceptional	Fair	84c
	Repairs and hardware	1990s	Moderate	Fair	

Fort Denison Conservation Management Plan

Room B6/B7	Former other ranks' quarters	Date	Significance	Condition	Figure
Windows	Timber-framed, double hung	1850s	Exceptional	Good	
	Repairs to windows	1990s	Moderate	Fair	
Fireplace	Stone chimneybreast and hearth	1850s	Exceptional	Fair	84d
	Cast-iron solid fuel heater	1950s	Moderate	Poor	



(a) Room B2/B3 looking east



(b) Room B2/B3 looking south-west



(c) Room B4 looking north-east



(d) Room B4 looking south-west



(e) Detail of fireplace in Room B4



(f) Room B5 looking north-east



(g) Room B5 looking south-west



(h) Detail of fireplace in Room B5

Figure 88 Photographs of Fort Denison in 2018 (Orwell & Peter Phillips)



(a) Window in Room B4 showing oil damage to plaster reveals (2018)



(b) External door to Room B4 (2018)



(c) Room B6/B7 looking south-west (2018)



(d) Room B6/B7 looking south-east, showing fireplace and chases for floor vents (2018)



(e) Detail of floorboards in Room B5 (2018)



(f) Subfloor area under Room B6/B7 showing standing water at high tide (2016)

Figure 89 Photographs of Fort Denison in 2016–18 (Orwell & Peter Phillips)

Fort Denison Conservation Management Plan

	Archway	Date	Significance	Condition	Figure
Floor	Concrete	1920s?	Moderate	Good	85a
Walls	Sandstone, painted	1850s	Exceptional	Fair	85a
	Cement render	1920s?	Intrusive	Fair	
	Sacrificial render	2000s	Little/low	Fair	
Ceiling	Sandstone vault, painted	1850s	Exceptional	Fair	85a
Doors	(Entry) Timber-framed and braced, arched head	1900s?	High	Fair	85a

Room B8	Entry to battery	Date	Significance	Condition	Figure
Floor	Concrete	1920s?	Moderate	Good	85b
Steps	Stone	1850s	Exceptional	Good	85b
Walls	Sandstone, painted	1850s	Exceptional	Fair	85c
	Cement render	1920s?	Intrusive	Fair	85b
	Sacrificial render	2000s	Little/low	Poor	85b
Ceiling	Sandstone vault, painted	1850s	Exceptional	Fair	85b
Doors	Double timber-framed and braced, wrought iron bars and hardware	1850s	Exceptional	Fair	85b
	Vision panels to above	1960s?	Intrusive	Fair	85c
	Single timber-framed and braced doors to battery	1850s?	Exceptional	Fair	

Room B9	Exhibition	Date	Significance	Condition	Figure
Floor	Timber boards	1980s?	Little/low	Good	85d
Skirting	Timber quad	1920s?	High	Fair	85d
Walls	Stone	1850s	Exceptional	Unknown	85d
	Cement render, painted	1920s?	Moderate	Good	
	Metal vent shaft, painted	1920s?	High	Good	
	V-jointed timber boarding	1920s?	High	Good	85e
Ceiling	Sandstone vault on iron beam	1850s	Exceptional	Fair	85d
Doors	Timber-framed and braced	1850s	Exceptional	Good	85d
	Repairs and hardware	1990s	Moderate	Fair	
	Timber ledged and boarded	1920s?	High	Good	85e
Windows	Timber-framed, double hung	1850s	Exceptional	Good	
	Repairs to windows	1990s	Moderate	Fair	
Fireplace	Stone hearth and cast-iron VR chimneypiece	1850s	Exceptional	Fair	85e
	Brick hearth, cast-iron surround and timber mantel shelf	1900s?	High	Fair	

Fort Denison Conservation Management Plan

Room B10	Exhibition	Date	Significance	Condition	Figure
Floor	Timber boards	1980s?	Little/low	Good	85f
Skirting	Timber quad	1980s?	Little/low	Good	85g
Walls	Stone	1850s	Exceptional	Fair	85g
	Cement render, painted	1920s?	Little/low	Poor	85g
	V-jointed timber boarding	1920s?	High	Good	85f
Ceiling	Sandstone vault on iron beam	1850s	Exceptional	Fair	85g
Doors	Timber-framed and braced	1900s	High	Good	85g
	Repairs and hardware	1990s	Moderate	Fair	
	Timber ledged and boarded	1920s?	High	Good	85e
Windows	Timber-framed, double hung	1850s	Exceptional	Good	85g
	Repairs to windows	1990s	Moderate	Fair	
Fittings	Iron brackets in walls	1850s	Exceptional	Fair	85g

Room B11	Exhibition	Date	Significance	Condition	Figure
Floor	Timber boards	1980s?	Little/low	Good	86a
Walls	Natural rock and sandstone	1850s	Exceptional	Fair	86b
	Sandstone indents	1990s?	Moderate	Good	
Ceiling	Sandstone vault on iron beam	1850s	Exceptional	Fair	86a
Doors	Timber-framed and braced	1990s?	Moderate	Good	86b
Windows	Timber-framed, double hung	1850s	Exceptional	Good	
	Repairs to windows	1990s	Moderate	Fair	
Fittings	Iron brackets in walls	1850s	Exceptional	Fair	86a
Fireplace	Stone chimneybreast and hearth	1850s	Exceptional	Good	86b
	Cast-iron hob grate	1850s?	High	Good	

Room B12	Office	Date	Significance	Condition	Figure
Floor	Timber boards	1980s?	Little/low	Good	86d
Walls	Sandstone	1850s	Exceptional	Unknown	86c
	Plaster and staff mould	1850s	Exceptional	Fair	
Ceiling	Sandstone vault on iron beam	1850s	Exceptional	Fair	86d
Doors	Timber-framed and braced	1990s?	Moderate	Good	86c
	Timber four-panelled	1850s	Exceptional	Good	86e
Windows	Timber-framed, double hung	1850s	Exceptional	Good	86c
	Repairs to windows	1990s	Moderate	Fair	
Fireplace	Stone chimneybreast and hearth	1850s	Exceptional	Fair	86d
	Cast-iron hob grate	1850s	Exceptional	Fair	
	Cast-iron chimneypiece	1850s	Exceptional	Good	

Fort Denison Conservation Management Plan

Room B13	Lobby	Date	Significance	Condition	Figure
Floor	Timber boards	1980s?	Moderate	Good	
Walls	Sandstone	1850s	Exceptional	Fair	86e
Ceiling	Sandstone vault	1850s	Exceptional	Fair	86e
Doors	Timber-framed and braced	1850s	Moderate	Good	86e
	Timber four-panelled	1850s	Exceptional	Good	
	Repairs and hardware	1990s	Moderate	Fair	

Room B14	Male WCs	Date	Significance	Condition	Figure
Floor	Terrazzo tile	2000	Little/low	Good	86f
Walls	Sandstone, painted	1850s	Exceptional	Poor	86f
	False terrazzo and glass panels	2000	Intrusive	Good	
Ceiling	Sandstone vault on iron beam	1850s	Exceptional	Fair	86f
Doors	Timber-framed and braced	1990s?	Moderate	Good	
Windows	Timber-framed, double hung	1850s	Exceptional	Good	
	Repairs to windows	1990s	Moderate	Fair	
Fireplace	Stone chimneybreast and hearth	1850s	Exceptional	Fair	86f
	Cast-iron chimneypiece	1850s	Exceptional	Fair	
	Remnant of hob grate	1850s	Exceptional	Poor	
Fittings	Sanitary fittings and cubicle	2000	Little/low	Good	86f

Room B15	Female WCs	Date	Significance	Condition	Figure
Floor	Terrazzo tile	2000	Little/low	Good	
Walls	Sandstone	1850s	Exceptional	Poor	87a
	Render	1920s?	Little/low	Fair	
	False terrazzo and glass panels	2000	Intrusive	Good	
Ceiling	Sandstone vault on iron beam	1850s	Exceptional	Fair	87a
Doors	Timber flush	1990s?	Little/low	Good	
Windows	Timber-framed, double hung	1850s	Exceptional	Good	
	Repairs to windows	1990s	Moderate	Fair	
Fittings	Sanitary fittings and cubicles	1990s	Little/low	Good	87a



(a) Archway through to Room B8



(b) Room B8: doors and steps to battery



(c) Room B8: door to battery looking north-east



(d) Room B9 looking east



(e) Room B9 looking south



(f) Room B10 looking east



(g) Room B10 looking west

Figure 90 Photographs of Fort Denison in 2016 (Orwell & Peter Phillips)



(a) Room B11 looking north



(b) Room B11 looking south, showing non-military hob grate



(c) Room B12 looking north



(d) Room B12 looking south to fireplace



(e) Room B13 looking north-east, showing panelled door to former officers' quarters



(f) Room B14 looking east, showing raised floor and false walls in front of fireplace

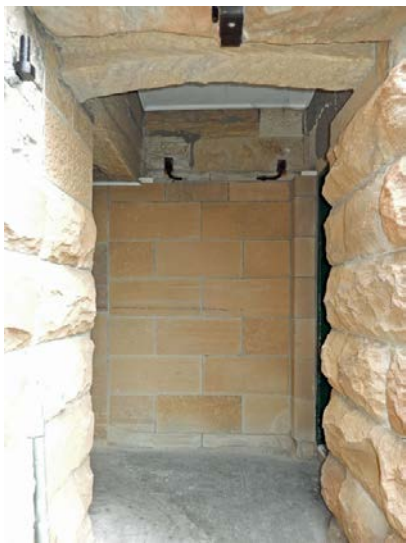
Figure 91 Photographs of Fort Denison in 2016 (Orwell & Peter Phillips)



(a) Room B15 looking south-east



(b) Room W1 looking west



(c) Room W2 looking south-west



(d) Room W3 looking south-east



(e) Room W1 looking south-east



(f) Exterior of West Room, slipway and slip yard looking east

Figure 92 Photographs of Fort Denison in 2016 (Orwell & Peter Phillips)

5.4.5 West Room

West Room exterior		Date	Significance	Condition	Figure
Walls	Sandstone	1850s	Exceptional	Fair	87f
Loopholes	Stepped sandstone	1850s	Exceptional	Fair	87f
Roof	Bituminous membrane	1990s	Little/low	Good	88b

Room W1	West Room	Date	Significance	Condition	Figure
Floor	Concrete	1980s	Intrusive	Good	87b
Walls	Sandstone	1850s	Exceptional	Poor	87b
	Sandstone indents	1990s	Moderate	Fair	87e
Ceiling	Plasterboard	1990s?	Little/low	Good	87e
Door	Timber-framed, iron-sheeted	1850s	Exceptional	Fair	87e
Windows	Timber-framed, casements	1950s?	Moderate	Fair	87b
	Iron shutter	1850s	Exceptional	Fair	87e
Fireplace	Cast-iron hob grate	1850s	Exceptional	Fair	87e
	Iron chimneypiece	1850s	Exceptional	Fair	
Fittings	Iron equipment racks	1850s	Exceptional	Fair	87b

Room W2	Entry	Date	Significance	Condition	Figure
Floor	Concrete	1980s	Intrusive	Good	87c
Walls	Sandstone	1850s	Exceptional	Poor	87c
	Sandstone facing	1960s?	Moderate	Fair	
Ceiling	Fibre cement?	1950s?	Little/low	Good	87c

Room W3	Passage/switchroom	Date	Significance	Condition	Figure
Floor	Concrete	1980s	Intrusive	Good	87d
Walls	Sandstone	1850s	Exceptional	Poor	87d
	Sandstone facing	1960s ?	Moderate	Fair	
Ceiling	Stone slabs on iron joists	1850s	Exceptional	Poor	87d
Door	Wrought iron	1850s	Exceptional	Fair	87d
Fittings	Timber cupboard	1980s ?	Little/low	Good	87d

5.4.6 Slip yard and slipway

Slip yard		Date	Significance	Condition	Figure
Paving	Crushed sandstone	1910s	Moderate	Fair	74
	Concrete	1940s?	Moderate	Good	88c
Walls	Outer sandstone	1917	Moderate	Fair	74
	Inner (to battery)	1850s	Exceptional	Fair	88e
	Wall and doorway between slipway and slip yard	1980s?	Little/low	Fair	
Shelter	Timber structure, steel roofing	2010s	Little/low	Good	88e
Steps	Timber	1940s?	Little/low	Fair	76
Services	Electrical substation and pumps	2000s	Little/low	Good	88c–d
Barbecue	Stone structure (previous location of one o'clock gun)	1970s	Little/low	Poor	75

Slipway		Date	Significance	Condition	Figure
Paving	Concrete	1940s?	Moderate	Fair	74
Walls	Sandstone	1917	Moderate	Fair	74

5.4.7 Battery

Battery		Date	Significance	Condition	Figure
Surface	Grass	1910s?	Moderate	Good	89b
Walls	Sandstone	1840s	Exceptional	Fair	61
	Natural rock face	1840s	Exceptional	Poor	88f
	Vaulted entrance and steps	1850s	Exceptional	Good	89a,b
Services	Underground water tank	1850s	Exceptional	Unknown	63
	Edge drain and grating	1920s?	High	Good	64
Landscape	Fig tree	1910s	High	Poor	64
Wet ditch & breakwater	Sandstone	1850s	Exceptional	Poor	60
Shell gun	8-inch iron shell gun	1854	Exceptional	Good	65
	Iron elevation screw on carriage (originally one of a number on display in the tower, but not related to the 32-pounder gun carriages)	1850s?	High	Good	
	Hardwood and iron replica of 32-pounder traversing gun carriage	2015	Little/low	Good	
	Iron traversing rail	1850s	Exceptional	Fair	
Bollard lights	Powder-coated steel	2017	Intrusive	Good	61

5.4.8 Bastion

Bastion		Date	Significance	Condition	Figure
Surface	Grass	1910s?	Moderate	Good	62
Walls	Sandstone	1850s	Exceptional	Fair	89c
Flagpole	Steel on concrete base	1980s?	Little/low	Fair	89d
Gun mount	Concrete mounting for 3-inch anti-aircraft gun	1942	Moderate	Good	62
One o'clock gun	Brass 12-pounder smoothbore muzzle-loading howitzer 9 cwt, serial no. LXXIII	1850	Exceptional	Good	62
	Timber gun carriage	1990s	Little/low	Poor	
Gun	Brass 12-pounder howitzer 6 cwt, serial no. LXIV	1848	Exceptional	Good	62
	Timber gun carriage	1960s	Little/low	Fair	
Gun	Brass 12-pounder howitzer 6 cwt, serial no. CLI	1841	Exceptional	Good	62
	Timber gun carriage	1960s	Little/low	Fair	



(a) Barracks roof looking north-east (2016)



(b) Barracks roof looking west (2016)



(c) Substation in former slip yard (2016)



(d) Services behind substation (2018)



(e) Slip yard shelter and battery wall (2018)

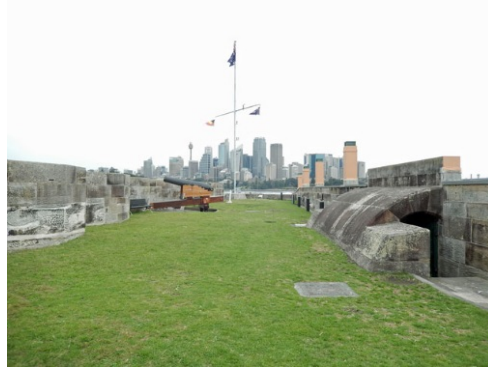


(f) Battery from the east (2016)

Figure 93 Photographs of Fort Denison in 2016–18 (Orwell & Peter Phillips)



(a) Battery looking north-east



(b) Battery looking south-west



(c) Bastion from the south



(d) Bastion looking south-west



(e) Former ficus bed at base of tower



(f) Barracks roof looking west

Figure 94 Photographs of Fort Denison in 2016 (Orwell & Peter Phillips)

6 Constraints and opportunities

6.1 Constraints flowing from significance

The main constraint flowing from the statement of significance for Fort Denison is the retention of the international and national significance of Fort Denison as an exceptionally fine, intact and unique 19th century Australian fortification and as an historic landmark prominently sited within Sydney Harbour.

The conservation of the integrity and authenticity of the 19th century construction and usage of Fort Denison as an historic landmark is the fundamental constraint flowing from its significance.

Conservation of the exceptionally significant fabric, features, ordnance and associated moveable relics related to the construction and usage of the fort is essential. In addition, the conservation of Fort Denison's visual appearance and setting, its authenticity and mythology as a place of mystery, intrigue and isolation, both historical and physical, should be conserved.

Some fabric and features of Fort Denison also demonstrate the use of the fort during the 19th and 20th centuries for maritime and navigation purposes. Fabric and features nominated as of high significance should be retained and conserved as evidence of maritime and navigation usage. Some fabric and features of moderate significance dating from this period, including repairs to the fabric over a long period, should be considered for conservation as well.

Elements of little/low significance can be removed to reveal the greater cultural significance of the place. Intrusive elements should be removed when circumstances permit.

6.2 Statutory constraints

The heritage planning context for the conservation policies derives from Acts and Regulations applying to the land.

6.2.1 *National Parks and Wildlife Act 1974*

The objects of the *National Parks and Wildlife Act 1974* (section 2A) include:

(b) the conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including, but not limited to:

- (i) places, objects and features of significance to Aboriginal people, and
- (ii) places of social value to the people of New South Wales, and
- (iii) places of historic, architectural or scientific significance,

(c) fostering public appreciation, understanding and enjoyment of nature and cultural heritage and their conservation

Under section 151 of the Act, the Minister may lease land within a national park, subject to certain considerations. Section 151A of the Act limits the purposes for which leases may be granted, which include among others:

- research facilities for natural or cultural heritage
- facilities for activities of a recreational, educational or cultural nature
- any other purpose consistent with the management principles for the land, which in the case of historic sites include conservation, sustainable visitor or tourist use and enjoyment compatible with the conservation of the values of the site, and the sustainable use (including adaptive reuse) of buildings or structures.

Section 151B specifies the matters that the Minister must take into account before granting a lease. Under that section:

- (1) The Minister must not grant a lease or licence of land (including any buildings or structures on the land) under section 151 unless the Minister is satisfied that:
 - (a) the purpose for which the lease or licence is granted is compatible with the natural and cultural values of:
 - (i) the land to be leased or licensed, and
 - (ii) land reserved under this Act in the vicinity of that land, and
 - (b) the lease or licence provides for the sustainable and efficient use of natural resources, energy and water, and
 - (c) in relation to any lease or licence that authorises the erection of a new building or structure on the land or the modification of an existing building or structure on the land—the authorised development or activity is appropriate in relation to the built form and scale of the building or structure, including its bulk, height, footprint, setbacks and density.

6.2.2 Sydney Harbour National Park Plan of Management 2012

The National Parks and Wildlife Service prepares plans of management for all its properties. The current plan that applies to Fort Denison is the *Sydney Harbour National Park Plan of Management 2012*, under which Fort Denison is Precinct 10. The outcomes for the national park are:

1. conserve the natural values of the park
2. celebrate and nurture contemporary and traditional Aboriginal culture
3. celebrate the historic heritage values of the park
4. provide enriching and memorable experiences in the park
5. improved access to the park for all
6. strengthen and create partnerships.

Each of these outcomes has a corresponding aim for the Fort Denison precinct:

- Monitoring of climate change-induced sea level rise will guide future planning and use of the precinct.
- The Aboriginal cultural heritage of the island prior to the construction of the fortifications will be researched and interpreted where appropriate.
- The fort will be conserved and the rich history of the island will be made available to visitors.
- Traditional passive recreation will be maintained and enriched with new tourism opportunities, allowing a range of visitors the special 'island and historical experience' of Fort Denison.
- Due to the predicted vulnerability of the site to salt water inundation because of climate change-induced sea level rise, the wharf and other facilities will be upgraded as a priority to allow access for all. The fort's appearance will be to the highest possible standard and the significant visual elements of the fort will be well presented to the public.
- Develop partnerships with stakeholders to improve visitor opportunities and conserve the fort.

The actions arising from these aims include the following:

- Examine options for energy and water saving and the reduction of waste collection.

- Continue seagull management to prevent the island becoming a nesting place.
- Research contemporary, contact and post-contact Aboriginal history.
- Manage the moveable heritage collection.
- Encourage ongoing historical research into the development of the fort.
- Monitor the condition of significant plantings and turf the battery terrace.
- Promote the fort's educational opportunities.
- Continue a program of preventative and cyclical maintenance.
- Continue the current lease of the barracks and forecourt for purposes of a café, restaurant and function centre.
- For any new lease, consider new adaptive uses to support sustainable visitor and tourist use and enjoyment.
- Continue daily tours of the island, limiting visitors to no more than 200 at any one time and visitors to the Martello tower to a maximum of 20 per guided group.
- Continue the key role of the island in special events on Sydney Harbour.
- Permit the construction of storage facilities in the yard subject to approval after heritage and environmental assessment.
- Develop a detailed design for an undercover outdoor dining and function area that does not compromise the visual presentation of the fort.
- Monitor, assess and address the impact of sea level rise, wave action and boat traffic on the fort structure.
- Maintain the toilet facilities for the disabled to an accessible standard.
- Adapt the wharf to allow improved access in accordance with the *Disability Standards for Accessible Public Transport 2002*.

6.2.3 NSW Environmental Planning and Assessment Act 1979

Part V of the EP&A Act requires OEH to assess environmental impacts of activities proposed to be undertaken on NPWS lands. A Review of Environmental Factors (REF) is the established methodology used for undertaking such an assessment. A statement of heritage impact must accompany a REF for works affecting items of heritage significance.

6.2.4 Heritage Act 1977

As Fort Denison is listed on the NSW State Heritage Register the place must be maintained in accordance with the Minimum Standards for Maintenance and Repair as detailed in the Heritage Regulation 2012. Any works to the place require an approval from the Heritage Council of NSW unless they are works subject to standard exemptions under section 57(2) of the Heritage Act. There are currently no site-specific standard exemptions that apply to Fort Denison. Section 170 of the Heritage Act requires OEH to establish and keep a register entitled the 'Heritage and Conservation Register'. Under Section 170A OEH is required to manage Fort Denison with due diligence and in accordance with State Owned Management Principles and comply with any guidelines issued by the Heritage Council.

6.2.5 Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

Fort Denison is within the buffer zone of the World Heritage listed Sydney Opera House, as defined by the Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (**Figure 95**). OEH is not required to comply with a REP (regional environmental plans) where it concerns works within national park estate but OEH endeavours to comply with the intent

of the REP as a matter of best-practice. It is unlikely that any approved works on the island would be of a nature or extent to affect the World Heritage values of the Opera House.

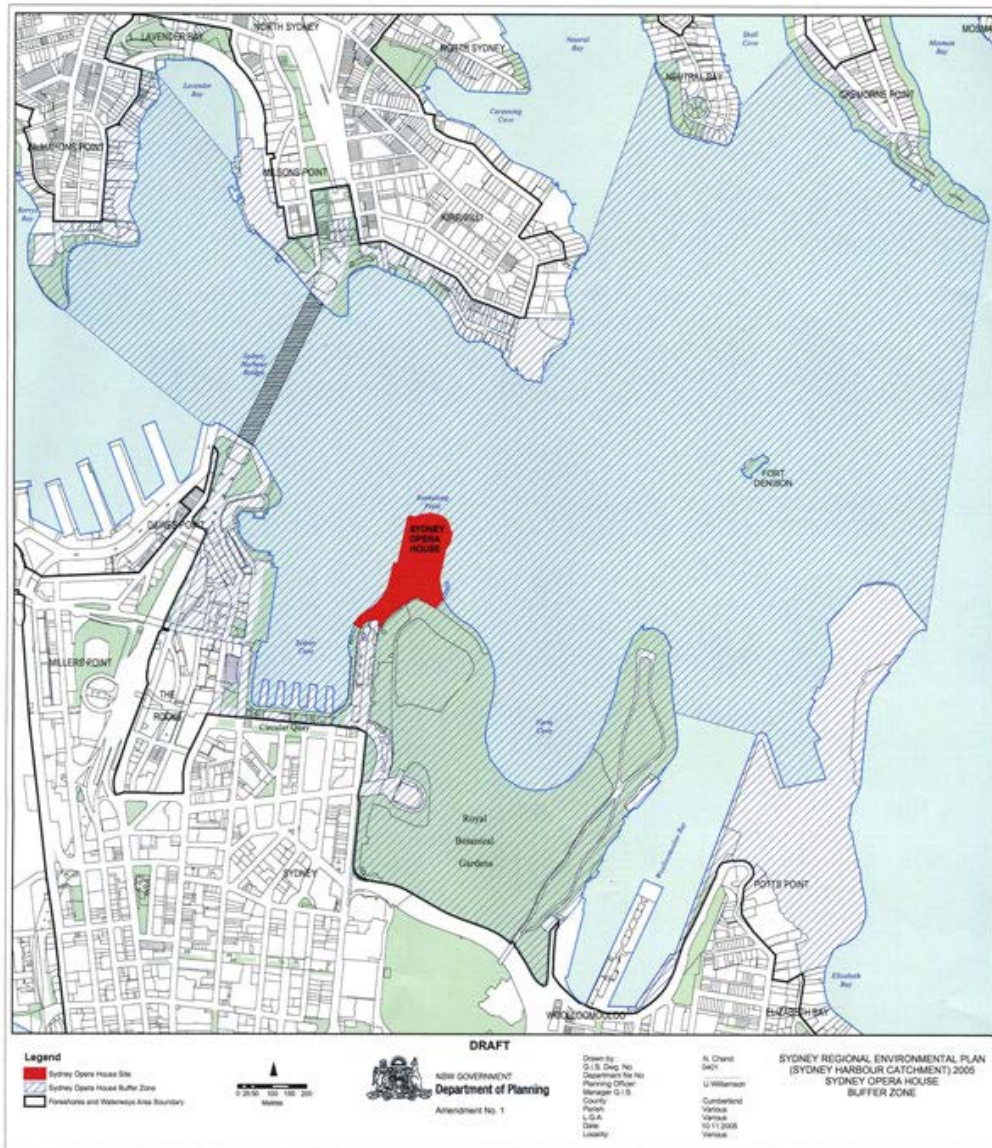


Figure 95 Map showing the buffer zone (blue hatching) of the Sydney Opera House World Heritage listing (UNESCO)

6.2.6 Environmental Protection and Biodiversity Act 1999 (EPBC Act)

OEH may need to refer to the Australian Government Minister for the Environment any proposal for works that could have a significant impact on an item protect under the EPBC Act, including items listed on the World Heritage List or the National Heritage List such as the Sydney Opera House.

6.2.7 Disability Discrimination Act 1992

The Transport Standards detailed under the Disability Discrimination Act place a compliance timetable on the upgrading of ramps and boarding services related to public transport services. Ninety per cent of ramps and boarding services are required to be compliant by 2018 and 100% by 2023. The *Disability Standards for Accessible Public Transport 2002* and the Australian Standard for access and mobility 1428.2-1992 detail the necessary standards

for the provision of wheelchair access on new works. Such access is required to cater for a maximum of 1:14 grade access for 85% of the high and low tide range.

6.3 Stakeholder interests

Several agencies have an ongoing interest in Fort Denison. NSW Roads and Maritime Services (RMS) owns and leases the wharf to OEH. The Port Authority of NSW manages the navigation light on top of the Martello tower and the tide gauge in the Tide Gauge Room. The Bureau of Meteorology maintains meteorological equipment on the flagpole. The NSW Office of Finance and Services' Land and Property Information maintains a Continuously Operating Reference Station (CORS) equipment on the island.

Fort Denison falls within the Metropolitan Local Aboriginal Land Council area. The Land Council is consulted on any proposals involving or affecting Aboriginal cultural heritage values.

Fort Denison is a well-known historic landmark in Sydney Harbour with a long history of providing access for guided tours and special events.

6.4 Physical condition and environment

The aggressive nature of the salt laden environment is a major ongoing issue for the conservation of the fort's sandstone, which requires a program and methodology of restoration. Critical areas include the zones intermittently immersed in water and spray. Major issues include stone selection and need for repointing. Other material conservation issues relating to the interiors include deterioration of sandstone surfaces due to rising and penetrating damp and salt attack and corrosion of iron elements such as roof beams in the barracks..

The barracks subfloor consists of a combination of bedrock and loamy fill which becomes inundated on high tides of over 1.8 metres as a result of seepage through the subfloor substrate.

The climate change impact most relevant to Fort Denison is that of sea level rise. Current estimates of sea level rise range by 2070 range from 0.2m (a low bound estimate) to 0.49m (a high bound estimate). This will further exacerbate the impact of ferry wash and wave run-up on the external stonework and rising damp and salt attack on the barracks internal walls. Localised effects have been reported and observed in the corners of the fort perimeter where concentration of wave energy causes higher elevation of wave splash and spray. It would be expected that the frequency and severity of these effects would increase into the future with sea level rise.²⁵⁴

6.5 Opportunities

This section details opportunities arising from consideration of heritage significance, the statutory management and legislative constraints and stakeholder interests.

6.5.1 Visitation

Active promotion of Fort Denison by NPWS resulted in an increase of visitors on guided tours from 20,500 in 1992–93 to 28,227 in only two years, with a large proportion of visitors

²⁵⁴ Royal Haskoning DHV, *Fort Denison Sea Level Rise Vulnerability Study*, 2018.

being on educational visits. The introduction of a café/restaurant increased public use of the site although the number of visitors on guided tours has steadily decreased. The closure of the café on expiry of the lease has further reduced visitor numbers.²⁵⁵ Given the proximity to Circular Quay and the fort's location in the inner harbour, an opportunity exists to establish Fort Denison as an iconic visitor destination and restore and improve visitation, particularly within the educational, domestic and in-bound cultural tourism markets.

6.5.2 Access

Visitation and commercial use of the site is solely reliant on regular and cost-effective ferry access, particularly from Circular Quay. Due to design and materials the wharf has a low capacity, allowing for vessels with maximum displacement of 32 tonnes at a berthing velocity of 0.2 metres per second. This reduces the pool of commercial vessel operators available to express an interest in providing commercial ferry access to the site. The current timetable is less than ideal with the earliest ferry arriving at 11am, which reduces morning trade. There is opportunity to replace the wharf for purposes of increasing its capacity and providing disabled access compliant with the 2002 *Disability Standards for Accessible Public Transport*. An opportunity also exists to improve the ferry timetable to allow for access prior to 11am.

6.5.3 Commercial uses

A café/restaurant was established in 1999 and operated until July 2017, demonstrating a commercially viable operation which however had adverse heritage impact on both the visual appearance of the courtyard and the fabric of the barracks building. Closure of the café resulted in an immediate reduction in visitor numbers, highlighting the importance of the café operation as a complementary visitor facility. An opportunity exists to re-introduce a commercial use which encourages visitation, enhances the visitor experience and facilitates maintenance and conservation of the site.

6.5.4 Interpretation

Interpretation at Fort Denison consists of stainless steel signs produced by the MSB prior to 1992, an audio-visual presentation in the West Room produced in 1999, static display panels in the barracks room produced prior to 2014 and guided tours of the Martello tower. Interpretation should be reviewed regularly to ensure that it remains engaging and relevant to visitors. There is an opportunity to improve interpretation by implementing a cohesive interpretation plan which could include modern interpretive techniques and media such as tablet-based augmented reality applications.

²⁵⁵ Personal communication with Greater Sydney Branch Discovery Coordinator, March 2018.

7 Conservation policies, guidelines and actions

7.1 Adopt best-practice conservation procedures

7.1.1 Background, opportunities and challenges

For general principles of conservation, the Australia ICOMOS (International Council on Monuments and Sites) Burra Charter²⁵⁶ is a widely accepted national standard of best-practice in the conservation of heritage places.

Buildings in the past were constructed using different materials and methods to those commonly used now, and these need to be understood when maintaining or making changes to the place. Well-intentioned but inappropriate works (for example, painting stone for weatherproofing) can cause irreversible damage, and installation of new services and similar works can have a cumulative negative impact. Special skills and experience are needed for the successful design and execution of traditional construction.

7.1.2 Policies

Policy 1

Fort Denison will be managed in accordance with this conservation management plan and the nationally accepted principles for best conservation practice detailed in the ICOMOS Burra Charter (2013).

Policy 2

A copy of this conservation management plan will be provided to all stakeholders involved in managing the site.

Policy 3

The conservation management plan should be updated as required to take account of changes in legislation, proposed changes in use or management, proposed major works, and/or new information about the place.

Policy 4

The design, approval and implementation of changes to the place, and its maintenance, should be undertaken by skilled people with the necessary expertise, equipment, materials, techniques and experience.

Policy 5

The design and documentation of any proposed works will be guided by a review of prior conservation and repair work.

²⁵⁶ *The Australia ICOMOS Charter for Places of Cultural Significance*, Australia ICOMOS, 2013: <http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf>

7.1.3 Strategies and guidelines

- Manage the place in accordance with the Burra Charter and its practice notes.
- Adopt a cautious approach to changes to the place, in accordance with the key Burra Charter principle of 'as much as necessary, as little as possible'.²⁵⁷
- Ensure that all aspects of conservation are equally considered and represented when undertaking work.
- Match the experience and expertise of the people engaged in work on the place to the tasks they are required to perform and the significance of the elements which may be affected by their work.
- Before making changes to the place, investigate in more detail where necessary to ensure that conservation decisions are well-informed, and be prepared to adjust those decisions should additional evidence emerge that affects previous conclusions.
- For any work on traditionally constructed parts of the building, use traditional materials and methods of construction, maintenance and repair and appropriately skilled tradespeople.
- Ensure that urgent maintenance and conservation activities are prioritised over other activities at the site.
- Provide site inductions for all those who work at Fort Denison to explain its significance and identify potential heritage impacts of the proposed work.
- OEH NPWS will aim to review the conservation management plan every five years, or earlier if new information becomes available which affects the significance of the site, new threats are identified, or any other major issue arises for which there is insufficient guidance in this CMP. A review may be issued as an addendum attached to this CMP detailing any additional information or changes to policies.

7.2 Acknowledge, retain and enhance heritage values

7.2.1 Background, opportunities and challenges

Fort Denison is a nationally and internationally significant 19th century fortification and prominent landmark in Sydney Harbour.

As a government agency and custodian of a state-significant heritage item, the NSW National Parks and Wildlife Service is obliged to manage Fort Denison in accordance with the State Owned Heritage Management Principles approved by the Minister for Heritage²⁵⁸. The NSW Roads and Maritime Services (responsible for the wharf) and Port Authority of NSW (responsible for the navigational aids mounted on the island) share some of this obligation in relation to their responsibilities.

7.2.2 Policies

Policy 6

The cultural significance of Fort Denison should be adopted as a primary basis for the management of the place.

²⁵⁷ Burra Charter Article 3.1.

²⁵⁸ NSW Heritage Office, *State Agency Heritage Guide*, NSW Heritage Office 2005.

7.2.3 Strategies and guidelines

- Adopt and implement the conservation management plan.
- Conserve and manage Fort Denison primarily as a nationally and internationally significant 19th century colonial fortification and prominent historic landmark in Sydney Harbour. Other secondary aspects of significance should also be considered in the conservation and management of the place.
- When making management decisions, retain, conserve and enhance the values identified in the statement of significance.
- Prepare heritage impact statements when proposing changes to the use or fabric of the place.
- New work should avoid adverse impacts on significant fabric, spaces, objects, archaeology, views and setting, and be reversible.

7.3 Facilitate ongoing use of the site

7.3.1 Background, opportunities and challenges

Fort Denison has not been used for defence purposes since 1900, apart from a brief period during World War II, and is no longer capable of practical use for defence purposes. The use of the site for navigational and scientific purposes remains feasible and will presumably continue. Although tourism has been associated with the island since the early 20th century, the continuing adaptation of the site for tourism and commercial purposes presents challenges to heritage values, to the conservation and maintenance of vulnerable building fabric in a harsh environment, and to the preservation of the setting of the place. In the past, this process of adaptation has sometimes led to the inappropriate alterations of spaces and fabric and the construction of intrusive new elements with some adverse heritage impacts. The use of the site for educational purposes has fewer implications for potential adverse heritage impacts.

The former use of Fort Denison for restaurant and function purposes required the adaptation of part of the former barracks for a commercial kitchen, which despite the over-sheeting of most existing surfaces resulted in damage to the fabric, and the erection of a permanent marquee which was an intrusive element in the setting of the place until its removal in 2017. The *Sydney Harbour National Park Plan of Management 2012* envisages both the continuation of a restaurant lease, and the construction of an undercover outdoor dining/function area. Unless less intrusive and damaging solutions are found for the adaptation of the place for these uses, it may be necessary to find other uses with less adverse heritage impact. Other challenges to the continuing use of the site for tourism and educational purposes include the provision of barrier-free access to much of the site.

It appears from the historical analysis and surviving physical evidence that the buildings on Fort Denison were utilitarian in character as constructed, with little in the way of internal decorative embellishment except in the officers' quarters, which were fitted with panelled doors and more elaborate chimneypieces. It is however likely (based on archaeological evidence) that those stationed on the island would have introduced furnishings and other decorative elements to make their lives more comfortable, as the Maritime Services Board caretakers did in the 20th century.

7.3.2 Policies

Policy 7

Primary use of Fort Denison should be directed towards public understanding, appreciation and enjoyment of the place, consistent with the conservation of its significant fabric, spaces, objects, archaeology, views and setting, and the continued use of parts of the site for navigation and scientific purposes.

Policy 8

Complementary and ancillary uses may be acceptable if they do not have an adverse impact on the significant spaces, fabric, objects, archaeology, views and setting of the place.

Policy 9

Uses with servicing, structural or spatial requirements that would have a major adverse impact on the character and significance of the place or its elements are unacceptable.

Policy 10

Future development on the site should aim to maximise the compatible use of existing spaces, and minimise the construction of new accommodation, consistent with avoiding adverse impacts on significant spaces, fabric, objects, archaeology, views and setting.

7.3.3 Strategies and guidelines

- Proposals for future uses will need to be subject to detailed design study to minimise their visual and physical impact on significance.
- Whenever changes to the place are contemplated seek opportunities to recover significance that has previously been lost through inappropriate action in the past.
- Introduce essential services and operational modifications having regard to the significance and setting of the elements of the place, with view to minimising visual impact and physical impacts on fabric.
- Consider uses which are compatible with the original utilitarian character of the fort.
- Changes to the configuration, use and fabric of the place should be limited to those areas that have already undergone significant modification, recovering the significance of these areas as much as possible.

7.4 Recognise layered history

7.4.1 Background, opportunities and challenges

Fort Denison has evolved over a long period and retains a physical record of its development in the surviving built elements, natural features, moveable items and archaeology. It is important that these layers of history can continue to be seen and understood, and that future physical works are discernible from earlier ones, without obscuring or overwhelming them. The cultural significance of Fort Denison has a number of aspects, including:

- the original natural beauty of the island, and its use by Sydney's Aboriginal people up until 1796

- the temporary use of the island following European settlement as a place of incarceration and deterrence of crime, from 1788 to the early 1800's
- the adaptation of the island for military purposes, including the construction of the present configuration of buildings, 1840 to 1900
- the use of the island for navigational and scientific purposes, 1856 to present
- the management and occupation of the island by the Sydney Harbour Trust and Maritime Services Board, 1901-1992
- management and conservation of the site as a cultural tourism destination, 1950s to present.

While the physical evidence of the early uses has largely disappeared, these aspects give rise to heritage values that are bound up with Fort Denison and contribute to the richness of its cultural significance.

7.4.2 Policies

Policy 11

Fort Denison should be conserved, managed and operated holistically in consideration of all its heritage values, while acknowledging the primary significance of the 19th century military period which has been most influential in the creation of the place as it now exists.

Policy 12

Conservation of the Fort Denison site should acknowledge the contribution of all significant development phases to the history of the site, and conserve physical evidence that distinguishes different phases of development.

Policy 13

New works should be designed as complimenting layers in Fort Denison's evolving history, without obscuring previous significant layers.

7.4.3 Strategies and guidelines

- Design and detail new work so that the new elements are fitted to the existing in such a way that they can be removed in future without adverse impact on significant fabric.
- Design new work to be both distinguishable from existing work and sympathetic to adjacent significant elements.
- Use period detailing only for reconstruction and where clear evidence of the former element exists and make it distinguishable from original work on close inspection.

7.5 Manage environmental challenges

7.5.1 Background, opportunities and challenges

Fort Denison is located in a maritime environment that is destructive to both the natural and introduced materials from which it is constructed. The Stonework Conservation Strategy prepared by the Government Architect's Office in 2007 noted that 'the aggressive environmental causes of the deterioration at this site are ongoing and it is not possible to stop the stonework from deteriorating'.

Already during high tides, Fort Denison is subject to penetration of seawater beneath the suspended timber floor of the barracks and wave overtopping causing minor submergence of the western forecourt through the opening in the seawall. Overtopping is also affecting the slip yard area and West Room windows.

A study of the vulnerability of Fort Denison to sea level rise was carried out in 2008 and revised in 2018 and found that Fort Denison is particularly vulnerable to any form of sea level rise.²⁵⁹ The entry through the western seawall to the forecourt area, at a mere 1.41 metres Australian Height Datum (AHD), is the most obvious and vulnerable point of ingress for seawater. The highest recorded water level at Fort Denison (since 1914) was 1.475 metres AHD on 25 May 1974, some 65 millimetres higher than the current entry point to the fort. A 2100 'high' sea level rise scenario estimates that the forecourt would be submerged by seawater up to 50 times per year to a depth of 45 centimetres.

In addition to the threat from inundation due to still water levels, wave climaxes discharge energy against the external vertical walls of the fort resulting in seawater being elevated up the face of the wall to significant heights. These are exacerbated by twin-hulled ferries passing close to the island at speed. The lower crested western seawall and curvilinear wall around the slip yard/barbecue area are currently exceeded by 100-year Average Return Intervals (ARI) design wave run-up levels by more than 2.2 metres. Considering the projections for future sea level rise, these structures will become increasingly vulnerable to wave run-up and overtopping over time.

Inundation from seawater due to larger sea level rises will substantially compromise the useability and general accessibility of the site as well as the maintenance of the built heritage assets, flooring systems, etc. Under these circumstances significant alterations may be necessary to continue use of the site while accommodating a mean sea level rise of up to one metre. These alterations could include:

blocking up the existing entry point with a continuous western seawall,

- raising the crest of seawalls to reduce the frequency and severity of wave run-up and overtopping
- installing wave deflector structures to the crest of vulnerable seawalls to limit wave run-up and overtopping from entering inside fort walls and deflect wave splash and spray in a seaward direction
- raising the height of the surrounding rock platform in certain areas by constructing perimeter berms that initiate wave breaking and dissipation of energy before the fort seawall is impacted
- installation of fixed or floating wave attenuation structures in certain locations around the perimeter of the fort to reduce the incident wave height.²⁶⁰

Sea level rise is projected to increase at an accelerated rate well beyond the conventional planning horizon of 2100. Beyond 2100, in the absence of substantial changes to the integrity of the current built form, Fort Denison will become a progressively submerged ruin.

²⁵⁹ *Fort Denison Sea Level Rise Vulnerability Study*, DECC, October 2008.

²⁶⁰ Royal Haskoning DHV, pp 31-32.

7.5.2 Policies

Policy 14

Future development and maintenance of the site should be undertaken to protect significant fabric, spaces, archaeology views and setting in the light of existing and predicted natural environmental impacts, including high tides, wave overtopping and rising sea level.

7.5.3 Strategies and guidelines

- Carry out continued monitoring and reporting of the impact of high tides and ferry wash, particularly where these coincide with low pressure systems (which result in higher than predicted tides).
- Consideration should be given to blocking up the existing entry point in the western seawall and advice should be sought on the best method to prevent overtopping of the seawalls.
- Modification of the slipway and slip yard seawall to enable ongoing protection from wash and wave action is acceptable.
- Roads and Maritime Services should be approached to explore the possibility of limiting the speed of twin-hulled ferries when passing the island to reduce impact of wash on the fort.
- A climate change adaptation plan should be prepared for Fort Denison which details scenarios for sea level rise based on latest sea level rise projections, likely impacts on the fort and timeframes for implementation of the necessary solutions to minimise impacts.
- Develop a disaster management plan for the protection of the contents, and where possible the fabric, of the lower levels of the site.
- Budget for maintenance works to be both more extensive and more frequent than for sites in less aggressive environments.
- Ensure that adequate time is allocated on an annual basis for maintenance even when maintenance actions may require the shut-down of the site for all other activities.

7.6 Maintain an appropriate setting

7.6.1 Background, opportunities and challenges

Fort Denison is a uniquely visible site in Sydney Harbour, with an instantly recognisable form and silhouette which are essential to its significance as a landmark. Some recent additions tended to diminish the character and setting of the early building. A large marquee with a white pitched roof that was formerly on the terrace blocked views to and from the barracks and prevented visual appreciation of the relationship of the Martello tower to the barracks building and the Tide Gauge Room. This temporary marquee was removed in 2017 and the setting consequently restored. Some of the outlying features of the setting, such as the wet ditch and breakwater on the south-east side, appear to have been lost since 1986.

Although Fort Denison tends to be viewed mainly from the west, as this is the side by which it is approached as well as the side visible to the city and Harbour Bridge, the island can be seen from any direction. Views from the island are also important in most directions. Consequently, there is little opportunity for alterations or additions on the site which will not be highly visible. The slip yard, with its low archaeological potential and more recent fabric, is the area least sensitive to physical change.

There is little evidence of any planting or vegetation during the military period, and indeed it is unlikely that there would have been any, particularly not on the battery. The island was extensively planted during the early and mid-20th century (**Figure 22, Figure 53**) but much of this planting has since been removed. The fig tree on the battery appears to be close to the end of its life, but the palm tree on the terrace (which may be 100 years old) appears reasonably healthy. From an interpretation point of view, it may be desirable not to replace the fig tree when it eventually dies. The grass cover to the battery could also be removed in future to improve interpretation by revealing surviving gun races and other archaeological evidence, whereas the grass enclosed by the former ficus bed against the wall of the Martello tower is entirely appropriate for interpretation of this early 20th century addition. The palm tree could be allowed to remain (and be replaced in due course) as evidence of the 20th century period that does not unduly interfere with interpretation of the 19th century military period.

7.6.2 Policies

Policy 15

New development at Fort Denison should not adversely impact on the landmark qualities of the place or on significant views to and from the site. Aspects of the setting that have been lost should where possible be recovered.

7.6.3 Strategies and guidelines

- Locate, design and construct any new structures to minimise impact on the setting of the fort (including the visual characteristics of the fort on arrival at the site), and on visitor circulation around the site.
- New structures that are not concealed from view by early walls should be designed to be as transparent or invisible as possible. As views to the site are predominantly horizontal, consider structures with horizontal rather than pitched roof forms.
- Any new structure on the terrace should be limited in height so that the roof of the barracks remains visible when viewed from the water. Materials should be of a neutral colour and matt finish that allows the significant fort elements to remain visually prominent.
- Reconstruction and interpretation of the breakwater and wet ditch would enhance the significance of the place and opportunities should be sought to reinstate these.
- When significant trees and other plantings have reached the end of their life, review their role in interpretation of the place and where appropriate replace them with new plantings of the same species in the same location.

7.7 Conserve according to significance

7.7.1 Background, opportunities and challenges

The Fort Denison site includes numerous physical elements in the form of structures, spaces, moveable artefacts, archaeological relics and landscape elements. There are also numerous intangible aspects of significance including associations and social values. There is considerable variation in the extent to which each of these elements contributes to the overall significance of the place, and also in the extent to which changes to the elements can be made without loss of significance. These differences provide the key to the conservation

management of the site and indicate how adaptation and change can be achieved without loss of significance.

7.7.2 Policies

Policy 16

The appropriate conservation process for each element of the place should be determined based on the relative significance ranking of the element and its contribution to the cultural significance of the place as a whole.

7.7.3 Strategies and guidelines

- Retain and conserve fabric and spaces of exceptional and high significance, including surviving evidence of original and early finishes.
- Retain and conserve fabric and spaces of moderate significance, although there is opportunity for alteration provided the overall significance of the place is not adversely affected and impacts are mitigated.
- Fabric of little/low significance may be removed or altered where higher-ranked fabric or spaces can be recovered or enhanced, or where new works are proposed, provided the overall significance of the place is not adversely affected.
- Retain fabric of little/low significance where required for essential operational requirements, or where it facilitates new uses and/or interpretation.
- Remove elements identified as intrusive, unless they are internal elements that are actively protecting significant fabric.
- When circumstances permit, recover significance through removal of intrusive fabric and (where evidence is available) restoration or reconstruction of missing significant elements.
- Retain, label, protect and store (if possible on site) significant built elements previously removed, or unavoidably removed as part of future works, with a view to their eventual reinstatement.
- Continue to make use of sacrificial materials and components to protect and maintain significant elements.
- Maintain the fabric to at least the standard required by the NSW Heritage Council's Minimum Standards for Maintenance and Repair²⁶¹, and prepare and implement a Schedule of Conservation Works and cyclical maintenance plan for the place.
- Refer to the Heritage Council's Maintenance series²⁶² for guidance on the treatment of individual components, materials and finishes and seek expert advice in the treatment and conservation of significant materials and elements.
- Document and undertake the treatment of any hazardous materials with a thorough understanding of the options for retention, encapsulation or removal.
- Significant fabric must only be replaced when deterioration cannot be retarded and it is beyond further repair, or its replacement will benefit conservation of other significant fabric.

²⁶¹ NSW Heritage Office, *Minimum Standards of Maintenance and Repair*, NSW Heritage Office 1999.

²⁶² Accessible on line at www.environment.nsw.gov.au/Heritage/publications/#M-O

7.8 Manage moveable heritage

7.8.1 Background, opportunities and challenges

Fort Denison contains a considerable collection of moveable artefacts relating to both the military and maritime uses of the site. These are integral to the conservation management of the place, as well as being significant in themselves.

The Fort Denison moveable heritage inventory can be found in Appendix 2.

Several of the moveable (and some fixed) items have been relocated over the history of the site. One example is the one o'clock gun, which was originally fired from a traversing platform in the southern bastion, then transferred to the location of the former barbecue²⁶³, and is now located at the south-western end of the battery.

Some items present challenges, such as the stove in Room B4 and the solid fuel heater in Room B6/B7. These have also been relocated during the period of occupation by the Maritime Services Board (as indicated in the 1944 plan and elsewhere) but do provide tangible interpretation of that period of occupation. They could be conserved and left free-standing within open fireplaces in the northern barracks rooms that have lost all evidence of previous Board of Ordnance fittings.

7.8.2 Policies

Policy 17

Retain and conserve the significant moveable heritage items and artefacts on site and maintain access to the collection for research and where appropriate public display and education.

Artefacts from archaeological excavations on the fort should be inventoried and stored together with movable heritage items in a single secure repository.

7.8.3 Strategies and guidelines

- Relocation of the one o'clock gun to a location which maintains or enhances the visual connection between the gun and the Sydney Observatory's time ball is acceptable, especially where that location has historic precedent.
- Update the inventory of moveable artefacts regularly and maintain a database recording the current location of all items together with a photograph, description and history for each.
- Where significant moveable artefacts associated with Fort Denison are no longer on site, explore opportunities to return them to the site provided suitable conditions for their conservation can be provided.
- Storage of moveable heritage items not required for interpretation in a secure facility off-site is acceptable, recognising that the environment on Fort Denison is not conducive to conservation and storage space is limited.

²⁶³ Kerr 1986, p.45.

7.9 Guide sustainable future development

7.9.1 Background, opportunities and challenges

The existing building and spaces on the site were mostly constructed for military uses, and therefore intended for access by the physically able and fit. Consequently, the existing spaces present considerable challenges to adaptation for new uses. Because the island is small and highly visible from all sides, opportunities for new development are very limited. Until recently, a permanent marquee was erected towards the north-east end of the terrace. Although functionally desirable because it was close to and at the same level as the former barracks, this structure was visually intrusive, blocking views both to and from the barracks and access to the Tide Gauge Room and accessible bathroom.

The recently constructed storage shed in the former slip yard at the south-western end of the island (a former location of the one o'clock gun) has had little impact on the island's historic setting, or on views to the battery and the Martello tower from the south-west. This relatively small area, currently occupied largely by services and storage, is one of the few potential areas for new development; the only other one being the battery, which is however considerably more visible, and accessible only by way of several steps.

The former restaurant and function centre uses of the site had some adverse impact on its significance, some of which has proved to be reversible. The construction of false walls and ceilings in the rooms of the barracks that were adapted for a commercial kitchen has not fully protected the fabric beneath, and any similar future proposal must be viewed with considerable caution. However, there are opportunities to explore new development that could allow current or different uses to operate, always with the primary aim of public understanding and enjoyment of the place consistent with its long-term conservation.

7.9.2 Policies

Policy 18

Explore ways to maintain or increase public access to and use of the place while reducing the heritage impact of associated new development on significant fabric, spaces, objects, archaeology, views and setting.

Policy 19

New proposals for commercial or adaptive reuse must include assessment of short and long-term impacts arising from visitation, operation of physical infrastructure and day to day operations and a methodology for monitoring and addressing any visitor and operational impacts on the fabric of the fort.

7.9.3 Strategies and guidelines

- Retain original means of natural light and ventilation and avoid the introduction of mechanical energy generation, heating, cooling and ventilation, unless this can be achieved without adverse heritage or curatorial impacts.
- Minimise the need for new structures by maximising the use of existing spaces while minimising impacts on those spaces and fabric.
- If a restaurant use is to continue at the site, consider constructing a new kitchen structure within the slip yard area, or ensure any future kitchen minimises impact on significant fabric, views and setting.

- Keep any new structures within the former slip yard area low in height, avoiding impact on significant views to the battery and Martello tower, and avoiding deep excavation for footings or services.
- The scale, material and height of any new structures must be appropriate and not detract from the visual dominance of the Martello tower, battery and barracks building.

7.10 Resolve operational issues

7.10.1 Background, opportunities and challenges

As part of Sydney Harbour National Park, Fort Denison needs to provide for safe access to and egress from the place and a safe and healthy environment for workers and the visiting public.

The National Construction Code (NCC; incorporating the BCA – Building Code of Australia) has been adopted by planning and building legislation in New South Wales as the technical standard for design, construction and operation of buildings. The NCC now includes the National Plumbing Code and will be progressively extended through the incorporation of other similar codes, as well as continuing to incorporate Australian Standards by reference. The BCA is a performance-based code, specifying only performance requirements to be met, but including ‘deemed-to-satisfy’ provisions that are accepted as meeting the performance requirements.

Old buildings, even if built to the highest standards of their time, are frequently non-compliant with the deemed-to-satisfy provisions of current building codes. Moreover, even recently upgraded buildings can become non-compliant as the BCA provisions may change annually.

The major challenge for Fort Denison is access to and within the site. There are external steps to the battery (in the centre and at the southern end) and internal steps within the Martello tower. The Plan of Management for Sydney Harbour National Park envisages the installation of handrails within the Martello tower (which has since been completed) but it needs to be acknowledged that the provision of equitable access for everyone to all parts of the site would require extensive adaptation that would result in unacceptable heritage impacts.

The present wharf is not compliant with current standards for accessible public transport and will need to be rebuilt to comply. The original landing place had stone steps, and the present wharf was constructed in the early 20th century as a heavy timber fixed structure in accordance with the normal practice of the time. Current construction practice is for a pontoon wharf secured by steel or concrete piles and connected to the land by a hinged bridge, allowing for ramp access that can adjust to varying tide levels. While such wharves normally have roofed shelters at either end of the ramp, constructing these at Fort Denison would be likely to create permanent visually intrusive elements.

7.10.2 Policies

Policy 20

Compliance with building codes should be achieved by meeting the performance requirements of those codes through alternative solutions if the deemed-to-satisfy requirements cannot be met without adverse heritage impact.

Policy 21

Adaptation or replacement of the wharf on the north-west side of the island to provide improved access for people with disabilities is acceptable, providing the access solution remains a visually unobtrusive element without roofed structures, and with the height of all new elements such as pontoon restraining piles kept to a minimum. Relocation of the wharf landing to the fort's original landing location, i.e. above the former stone steps, may be acceptable, subject to any necessary archaeological investigation and appropriate interpretation of changes in this location.

Policy 22

Adaptation for equitable access to the site should be provided only in places where it can be accomplished without adverse impact on the significance of the place and its elements.

7.10.3 Strategies and guidelines

- Use alternative solutions to achieve the performance requirements of the BCA.
- Install new services without further damage to significant fabric, through openings, cavities and ducts previously created.
- Design and install additional aids to access (such as handrails) so they are visually compatible (in material and form) with, and fixed with minimal impact on, significant fabric.
- If public access through the slip yard is contemplated, investigate the installation of a platform lift within the slip yard to provide access from the terrace to the battery.
- Refer to *Improving Access to Heritage Buildings*.²⁶⁴

7.11 Comply with heritage legislation

7.11.1 Background, opportunities and challenges

Fort Denison is listed as an item of state significance and is accordingly subject to the provisions of the *Heritage Act 1977*. The Act requires prior approval for works but includes provisions for exemption from normal approval requirements in certain circumstances. There are standard exemptions under the Heritage Act which apply to the place, covering matters such as maintenance and cleaning, minor repairs, landscape maintenance, and safety and security. Most standard exemptions still require notification to the Heritage Council. Site-specific exemptions may also be granted by the Heritage Council.

Listing of an item on the State Heritage Register requires all archaeology to be conserved in situ wherever possible and for any impacts to be approved by the Heritage Council. Fort Denison has a high potential to contain historical archaeological evidence relating to its early construction and use. The archaeological assessment prepared for this CMP has shown that the study area has the potential to contain the following remains:

- evidence of original masonry and fabric, fittings and construction associated with the 'convict shaped rock' battery (1840–42), the casemated barracks and tower, bastion (1856–58), loophole chambers and terrace (1858–62)
- subfloor deposits within (unexcavated) rooms of the barracks
- occupation deposits (particularly within the terreplein) dating to the early use of the fort (c.1840–62)
- evidence of changes in design particularly to the barracks, predominantly dating to the 20th century
- evidence of landscaping in the terreplein and terraces.

7.11.2 Policies

Policy 23

No works should be undertaken at Fort Denison without the necessary statutory heritage approvals. This includes works involving excavation which may require archaeological assessment and investigation.

²⁶⁴ Martin, Eric, *Access to Heritage Places Guidelines NSW*, January 2018.

7.11.3 Strategies and guidelines

- Negotiate with the NSW Heritage Council on site-specific exemptions under s.57 (2) of the Heritage Act if required.
- Consult relevant heritage consultants and authorities when any works to the site are contemplated. Any alterations, additions, excavation or other works on the site not covered by standard exemptions will require an approval under s.60 of the NSW Heritage Act from the Heritage Council or its delegate.
- All state-significant archaeology within the study area should be conserved in situ. If located, opportunities should be explored to preserve the potential archaeological remains on the site or reuse in interpretation.
- Comply with all Heritage Council and Heritage Division OEH guidelines.
- For any works including excavation, an Archaeological Research Design may need to be written as part of the s.60 application. This will identify the archaeological approach and methodology to be used on the site, and the type of archaeological questions the archaeological investigation might address. The archaeological program might include a phase of archaeological testing in areas of proposed subsurface impact depending on the nature of potential remains in these areas. Depending on the results of the testing and any mitigation of impacts, a program of archaeological excavation and recording may be necessary.
- Any s.60 application will be accompanied by a statement of heritage impact and a copy of the conservation management plan.
- Any artefacts collected and retained during works will need to be catalogued and securely stored by the client after the completion of the archaeological program.
- A report presenting the results of the archaeological program and artefact catalogue will be prepared at the end of the archaeological program.

7.12 Involve associated people and communities

7.12.1 Background, opportunities and challenges

While the management responsibility for Fort Denison rests ultimately with the NSW National Parks and Wildlife Service, there are numerous people and groups with a legitimate interest in what happens there. These include the local Aboriginal community, current and former Maritime Services Board staff, military groups, historians and the visiting public, especially those who have visited the place over a long period.

7.12.2 Policies

Policy 24

Community interest in Fort Denison should be acknowledged by appropriate involvement of stakeholders and other associated people in the conservation and future development and use of the site through structured programs of information sharing, consultation and site interpretation.

7.12.3 Strategies and guidelines

- Consult interested people and groups before finalising future conservation management plans and development proposals, in accordance with the *National Parks and Wildlife Service Community and Stakeholder Engagement Procedural Guidelines*.

7.13 Provide effective management

7.13.1 Background, opportunities and challenges

Despite Fort Denison being a very small site, there are at least four different parties involved in its management: the National Parks and Wildlife Service (for the majority), Port Authority of NSW (for the tide gauge equipment and navigational infrastructure), Roads and Maritime Services (for the lease of the wharf), and future lessees. Internally, management operations on the island are performed by staff from different OEH branches: Park Operations and Park Programs. This creates the potential for management tasks to be overlooked, neglected or omitted.

This conservation management plan will be most useful if it is integrated with existing systems for the care and management of Fort Denison, as well as informing plans for new development. Because maintenance tasks and small works such as introduction of new services are rarely subject to external scrutiny, unless informed by the conservation management plan they may unintentionally cause damage or result in lost opportunities for discovering new information from the physical fabric.

Site management is also important for controlling visitor numbers, both for the safety and comfort of visitors and for the protection of the site.

7.13.2 Policies

Policy 25

All stakeholders involved in managing assets on Fort Denison will be provided with a copy of this conservation management plan and any subsequent addendums.

Policy 26

OEH NPWS will implement a system to coordinate and monitor the activities of stakeholders involved in managing assets on the island to ensure compliance with this conservation management plan and to ensure that all parties comply with statutory heritage procedures and approvals.

Policy 27

Any lease over part of the site should include provisions requiring the lessee to comply with relevant provisions of the conservation management plan, including cyclic maintenance tasks and protection of the fabric, and sanctions (including termination of the lease) in the event of non-compliance.

7.13.3 Strategies and guidelines

- Prepare a coordinated operational management plan for the site which identifies responsibilities and tasks of those stakeholders responsible for managing assets at the site and provides for regular monitoring of the condition of the site and compliance with the policies of the conservation management plan.
- Include appropriate extracts from the conservation management plan in the site induction material for external tradespeople and contractors working on the site.

7.14 Record the place

7.14.1 Background, opportunities and challenges

Fort Denison has developed over a long period, and the documentary record of its development is patchy, some changes being documented in great detail and others only briefly or not at all. For this reason, much of the information about the place is contained in its physical fabric, and in many cases, this is only discoverable during work to the place. A set of measured drawings (hand drawn) was prepared in 1995, but this is now out of date as a result of recent works. No comprehensive plans of existing services have been located to date.

7.14.2 Policies

Policy 28

Records should be made and kept of all new evidence discovered about the place, and of the condition of the place before, during and after any changes.

7.14.3 Strategies and guidelines

- Collect, catalogue and make available to those responsible for managing the site all the available documents, drawings and historic photographs.
- Maintain measured CAD drawings of the site and a site survey with levels to assist in future planning and management.
- Assemble or prepare record drawings and manuals relating to all current site services.
- Prior to all works, undertake archival recording in accordance with Heritage Council guidelines for archival recording²⁶⁵ and photographic recording.²⁶⁶ Similarly, document any physical evidence uncovered during works.
- On completion of future works, require those undertaking the works to provide as-built drawings to OEH NPWS and update the record drawings accordingly.
- Ensure all records are retained by OEH NPWS in an electronic file of the office's records management system.

7.15 Tell the story

7.15.1 Background, opportunities and challenges

There is already a good deal of interpretive material about Fort Denison located in the permanent exhibition in the southern end of the barracks, and in various other places around the site. The National Parks and Wildlife Service website also includes material about Fort Denison and its history. There is scope for further interpretive material to be provided both on and off-site, particularly on site for those less mobile visitors unable to access parts of the site. Information related to the construction and use of the place as a fort and military establishment from 1836 to 1881 should be particularly improved and emphasised in future updates to the interpretation, to better reflect the exceptional significance of this phase.

²⁶⁵ NSW Heritage Office, *How to Prepare Archival Records of Heritage Items*, NSW Heritage Office 1998.

²⁶⁶ NSW Heritage Office, *Photographic Recording of Heritage Items Using Film or Digital Capture*, NSW Heritage Office 2006.

7.15.2 Policies

Policy 29

The story of Muddawahnyuh and Fort Denison, the site, building, activities, collection and people should be interpreted and presented throughout the site and beyond it.

7.15.3 Strategies and guidelines

- Prepare a new interpretation plan for Fort Denison.
- Seek further opportunities to interpret Fort Denison through the presentation of its significant spaces and fabric, and its collection of significant moveable artefacts.
- Ensure that key stories related to the exceptional and high levels of significance of the place have a prominent role in any interpretation, including the island's Aboriginal heritage and the fort's military history from 1836 to 1900.
- Consult the Aboriginal community when preparing a new interpretation plan.
- Continue the current practice of limiting access to sensitive areas such as the Martello tower to small groups accompanied by a tour guide.
- Continue the firing of the one o'clock gun.

8 Implementation

8.1 Short-term implementation (12 months)

Works should be undertaken to remove elements identified as causing damage to the place. Extensive catch-up maintenance in the barracks building, namely to the former lease area, in the form of sandstone conservation works, repairs to the flooring and re-painting of joinery has the priority in the short-term. Works to remediate areas of subsidence along the seawalls are also recommended.

8.2 Medium-term implementation (1-5 years)

The following table provides an implementation for actions to be implemented within five years. High priority actions include preparation and implementation of a Schedule of Conservation Works and Cyclical Maintenance Plan.

Policy category	Key actions	Timeframe
Adopt best-practice conservation procedures	Review and update the CMP after 5 years	5 years or earlier if required
Acknowledge, retain and enhance heritage values	Implement the conservation management plan	Ongoing
Manage environmental challenges	Prepare a climate change adaptation plan for Fort Denison.	1-5 years
	Prepare a disaster management plan for Fort Denison.	1-5 years
	Continue to monitor and record the impact of extreme high tides and unusual meteorological events.	Ongoing
Maintain an appropriate setting	Investigate the feasibility and advantages of reinstating the breakwater and wet ditch.	1-5 years
Conserve according to significance	Prepare and implement a schedule of conservation works and cyclical maintenance plan.	1-5 years
Manage moveable heritage	Create an inventory of artefacts and incorporate into the moveable heritage inventory.	1-5 years
	Store artefacts together with movable heritage items in a secure storage location.	1-5 years
Guide sustainable future development	Implement a methodology for monitoring visitor and operational impacts on the fabric of the fort.	12 months
Resolve operational issues	Investigate feasibility of providing a wheelchair accessible wharf.	1-5 years
Comply with heritage legislation	Comply with all Heritage legislation, Heritage Council and Heritage Division OEH guidelines.	When planning to undertake any works

Policy category	Key actions	Timeframe
Involve associated people and communities	OEH NPWS will consult with interested stakeholders when reviewing the CMP.	After 5 years or earlier if required
	Consult with interested stakeholders before finalising any proposals for development.	Prior to finalising any development proposals
Provide effective management	OEH NPWS will provide all parties responsibility for managing assets on Fort Denison with a copy of the endorsed CMP.	12 months
	OEH NPWS will implement a system to coordinate and monitor the activities of stakeholders involved in managing assets on the island.	1-5 years
Record the place	Collate and make available all available documents, drawings and historic photographs.	1-5 years
	Prepare measured drawings for the Martello tower.	12 months
Tell the story	Prepare a new interpretation plan for Fort Denison.	1-5 years

8.3 Interim Cyclical maintenance plan

The following interim cyclical maintenance plan outlines a minimum maintenance routine required to conserve the fort with the current low level of public use. Experience has suggested that increasing the maintenance periods greatly beyond those recommended may give rise to more extended damage and therefore higher repair costs over time. Because of the exposed situation of Fort Denison, maintenance frequency may need to be increased. Where no specialty is required to perform the maintenance item, an appropriate level of site induction is still required. This maintenance plan will need to be revised to accommodate any future proposal for change of use or intensity of use.

Daily		
location and item	Maintenance	Specialty or trade
Lavatories		
Generally	Clean WCs, urinals, basins and floors with water and disinfectant.	None required.
Barracks rooms, Martello tower magazine and gun room, Tide Gauge Room, West Room		
Floors – dust containing exfoliated stone, sacrificial render dust and salt.	Vacuum floor carefully with soft brush attachment, taking care not to drag vacuum cleaner across the surface or strike other surfaces. Place in rubbish bin for disposal off-site. Do <u>not</u> sweep magazine floor as this will scratch the asphalt surface.	None required.

Fort Denison Conservation Management Plan

Weekly		
location and item	Maintenance	Specialty or trade
Lavatories		
Generally	Clean cubicle doors, glass fireplace screen, shelving. Dust window sills.	None required.
Terrace		
Garden	Remove weeds.	None required.
Tide Gauge Room		
Glass floor display	Clean glass.	None required.
Display cases		
Wherever located	Clean glass/surface.	None required.
Barracks building		
Dish drain and other roof drains and gutters	Clear debris.	None required.
Battery		
Open drain	Clear debris.	None required.

Monthly		
location and item	Maintenance	Specialty or trade
Barracks building		
Metal patches in timber floor	Check that patches are not sharp or lifting and repair if required.	Inspection: none required Repair: OEH-approved contractor
Tower		
Drain at base of stairs to powder magazine	Clean out using strong flow of water and check that water flows to outside.	None required.

Quarterly		
location and item	Maintenance	Specialty or trade
Lavatories		
Pumps and sewer tanks	Clean and de-sludge, check operation.	Licensed plumber.

Half-yearly		
Location and item	Maintenance	Specialty or trade
Lavatories		
Window sills	Lift sills and gently brush stone underneath. Remove dust.	None required
Barracks building		
Timber floors	Inspect condition and check for rot, deterioration, scratches, termite attack.	Licensed builder or carpenter
Unpainted walls and ceilings	Inspect for deterioration, record stones in poor condition using stone marking drawings and close-up photographs. Desalinate walls through captive head washing and record results of water testing after each washing cycle. A minimum of two washing cycles is anticipated.	OEH-approved sandstone conservation specialist
Bastion		
Gun court	Inspect and remove weeds from cracks.	None required
Terrace		
Stormwater drains	Clean out gravel by hand.	None required
Battery		
Air vents in walls	Check for corrosion and undertake metals conservation work if required.	OEH-approved metals conservator
Bench seats	Oil with OEH-approved decking oil in accordance with manufacturer's specification for application.	None required
External lighting	Check lamps when timer reset at change of season.	None required
Annually		
location and item	Maintenance	Specialty or trade
Generally		
All timber elements	Annual inspection for termites, rot, borers and other deterioration and conduct termite treatment if required. Schedule for September, October or November each year.	OEH-approved termite inspector
External stone walls	Inspect stone and pointing for deterioration, record stones in poor condition using stone marking drawings and close-up photographs.	OEH-approved sandstone conservation specialist
Render and paintwork on walls and ceilings	Inspect for deterioration and/or salt accumulation on surface, record areas on drawings, then clean off. Test stone condition behind selected areas of permanent and sacrificial render.	OEH-approved sandstone conservation specialist

Fort Denison Conservation Management Plan

Annually		
Location and item	Maintenance	Specialty or trade
Stone steps	Inspect for deterioration and repair where required for public safety.	OEH-approved sandstone conservation specialist
Historic iron elements	Inspect and check for corrosion. Treat corrosion. Elements include but are not limited to ceiling beams, doors, shutters, accoutrement racks, manifold, fireplaces and grates, wall vents.	OEH-approved metals conservator
Floor ventilation	Inspect condition, check for stability.	OEH-approved metals conservator
Timber floors	Apply OEH-approved oil and wax.	OEH-approved builder or flooring specialist
Display panels and cases	Check for damage and firm fixing of light fittings. Clean glass.	None required
Contents of display cases and other moveable items	Inspect condition.	OEH-approved conservator
Taps	Inspect for drips and ease of operation.	None required
Tower		
Guns, replica cannon balls, powder barrels	Inspect for deterioration, damage, grime or salt. Clean. Treat corrosion.	OEH-approved metals conservator
Battery		
Water tank pump	Inspect for deterioration and service.	Licensed plumber
Guns	Inspect for deterioration, damage, grime or salt. Clean. Treat corrosion.	OEH-approved metals conservator
Fig tree	Inspect for pests, fungus and health.	OEH-approved arborist
Terrace		
Asphalt paving	Inspect for broken, undulating or subsiding areas and ponding. Check sewer pit and grease arrestor lids.	OEH Maintenance contractor
Palm tree	Inspect for pests, fungus and health.	OEH-approved arborist
Bubbler	Check for leaks, condition of washers.	Licensed plumber
Slip yard		
Storage shelter	Inspect for damage or deterioration.	OEH-approved building maintenance contractor
Transformer	Carry out annual service and repairs as indicated.	OEH-approved high voltage infrastructure maintenance contractor
Water meter	Check for leaks, condition of washers.	OEH-approved licensed plumber

Two-yearly		
Location and item	Maintenance	Specialty or trade
Generally		
Gutters and downpipes	Inspect for corrosion, correct gutter falls to downpipes.	OEH-approved building maintenance contractor
Chimney flashings and cappings	Inspect for loose or cracked leadwork, loose chimney covers.	OEH-approved building maintenance contractor
Membrane roofing	Inspect for damage, leaks, cracks and failing joints.	OEH-approved building maintenance contractor
Steel roofing	Inspect for rust, leaks.	OEH-approved building maintenance contractor
Timber-framed windows	Inspect for loose or damaged woodwork, defective putty, cracked or broken glass, worn sash cords, and check operation and hardware.	OEH-approved building maintenance contractor
Timber doors and frames	Inspect for loose or damaged woodwork, and check operation of doors and hardware.	OEH-approved building maintenance contractor
Barracks		
Subfloor areas	Lift hatches and previously cut floorboards and check for water ingress, rot, mould, and deterioration to subfloor joists, bearers and floorboards, brick piers, ant caps and stone footings.	OEH-approved building maintenance contractor
Lavatories		
Chimneys over WCs	Detach ducts and inspect inside chimneys for deterioration near fans.	OEH-approved sandstone conservation specialist
Tide Gauge Room		
Historic tide gauge	Inspect for damage and deterioration and undertake conservation works as required.	OEH-approved conservator
Battery		
Water tank	Inspect and record interior for deterioration of stone or pointing.	OEH-approved sandstone conservation specialist
Three-yearly		
location and item	Maintenance	Specialty or trade
Generally		
Painted surfaces	Check paintwork for cracks, deterioration, damage, peeling, mildew. Clean and repaint if required.	OEH-approved painter using OEH-approved specification.

Seven-yearly		
location and item	Maintenance	Specialty or trade
Generally		
External and internal structure	Inspect for structural distress (movement, cracking).	OEH-approved sandstone conservation specialist with referral to structural engineer if required.
Other		
location and item	Maintenance	Specialty or trade
Battery		
Flag mast	As required.	Subject to maintenance required.
Tide Gauge Room		
Modern tide gauge equipment	As required.	Port Authority of NSW or their authorised contractor.
Tower		
Bell, navigation light and solar panel	As required.	Port Authority of NSW or their authorised contractor.
Wharf		
Wharf	Inspections and works to be carried out in accordance with recommendations of latest wharf condition assessment or maintenance plan.	OEH-approved maritime infrastructure maintenance contractor

9 Bibliography

Australian National Maritime Museum, *Fort Denison Preliminary Maritime Archaeology Survey*, May 2007, unpublished report.

Brice M 2005, *A Chronicle of Forts and Fortresses*, Quantum Publishing, London.

Casey & Lowe 2013, *Darling Quarter (formerly Darling Walk), Darling Harbour, Sydney* [Archaeological Investigation], for Lend Lease Development, December 2013, available at http://caseyandlowe.com.au/rept_darling_quarter.htm

Clark M and Clark J 2000, *The Islands of Sydney Harbour*, Kangaroo Press.

Close CE, *Sketchbook of scenes of Sydney, Broken Bay, Newcastle and region, New South Wales 1817–1840*, NLA Ferguson Collection, available at: <http://nla.gov.au/nla.obj-138898767>

Collins D 1798, *An Account of the English Colony in New South Wales*, Volume 1.

Collins D 1802, *An Account of the English Colony in New South Wales*, Volume 2.

Collins English Dictionary, 12th edition, 2014.

Cosmos Archaeology 1999, *Maritime Archaeological Inspection for the Fort Denison Sewer and Power Project*, report prepared for NSW National Parks and Wildlife Service, March 1999.

Franklin B, *Stone: The role of petrography in the selection of sandstone for repair*, presented to the Heritage Office Seminar on Material Evidence, April 13-14, 2000

Gojak D 1997, *Forecourt at Fort Denison – Initial Investigation Report*, draft report for NSW National Parks and Wildlife Service, April 1997.

Glover TG 1878, 'Sydney Harbour, N.S. Wales' NLA ID. 4335744, available at: <https://trove.nla.gov.au/work/18393030?q&versionId=21587329>

Hoskins I 2009, *Sydney Harbour: A history*, University of New South Wales Press, Sydney.

Irish P 2017, *Hidden in Plain View: The Aboriginal People of Coastal Sydney*, New South Publishing, Sydney.

Karskens G 2009, *The Colony: A History of Early Sydney*, Allen and Unwin, Crows Nest.

Kerr JS 1986, *Fort Denison*, National Trust New South Wales, Sydney.

Kerr JS 2013, *The Conservation Plan*, 7th edition, originally published on behalf of The National Trust of Australia (NSW), Sydney.

Mann DD 1811, *The present picture of New South Wales, 1811*, [facsimile reprint 1979], John Ferguson in association with Royal Australian Historical Society, Sydney.

Martin E 1999, *Improving Access to Heritage Buildings: a practical guide to meeting the needs of people with disabilities*, Australian Heritage Commission, Canberra.

Mider DJ 1998, *Report on Archaeological Excavations. Fort Denison, Sydney Harbour*, report prepared for Sydney Harbour National Park, NSW National Parks and Wildlife Service.

Mider DT 1999, *Archaeological excavations: Barracks rooms, Fort Denison, Sydney Harbour*, report prepared for NSW National Parks and Wildlife Service.

Morris J 1998, *Where Convicts Never Stepped*, self-published.

National Parks and Wildlife Service 1999, *Fort Denison Conservation Plan*, NSW National Parks and Wildlife Service, Sydney.

- NSW Heritage Office 2000, *Assessing Historical Association: A Guide to State Heritage Register Criterion B*, NSW Heritage Office, Sydney.
- NSW Heritage Office 2001, *Assessing Heritage Significance*, NSW Heritage Office, Sydney.
- NSW Heritage Office 2003, *Conservation Management Plan: A Checklist*, NSW Heritage Office, Sydney.
- NSW Heritage Office 2006, *Assessing Historical Importance: A Guide to State Heritage Register Criterion A*, NSW Heritage Office, Sydney.
- Office of Environment and Heritage 2011, *Goat Island: A Contextual History*, NSW Office of Environment and Heritage, Sydney.
- Office of Environment and Heritage 2012, *Sydney Harbour National Park Plan of Management 2012*, NSW Office of Environment and Heritage, Sydney.
- Office of Environment and Heritage 2015, *National Parks and Wildlife Service Community and Stakeholder Engagement Procedural Guidelines*, NSW Office of Environment and Heritage, Sydney.
- Oppenheim P 2005, *The Fragile Forts: the fixed defences of Sydney Harbour 1788–1963*, Army History Unit, Department of Defence.
- State Heritage Register, 'Fort Denison', SHR 00985, available at:
www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045472
- Tench W 1789, *A Narrative of the Expedition to Botany Bay*.
- Tench W 1793, *A Complete Account of the Settlement at Port Jackson*, University of Sydney Library, Sydney, 1998, p.134.
- Watson PJ and Lord DB 2008, *Fort Denison Sea Level Rise Vulnerability Study*, NSW Department of Environment and Climate Change, Sydney.
- Whitfield CM 1982, *Barracks Life in the Nineteenth Century; or, How and Why Tommy's Lot Improved*, Material Culture Review / Revue de la culture matérielle, [S.I.], ISSN 1927-9264.
- Wilson GC 1987, *Preliminary Results of the Excavation of a Test Pit, North Western Terrace, Fort Denison*, report for Maritime Services Board of NSW.
- Woodthorpe V 1803, 'Pinchgut Island'. NLA Rex Nan Kivell Collection, NK1752/12, available at: <http://nla.gov.au/nla.obj-138473433>

Appendices

Appendix 1 State heritage

This 2018 inventory lists all the items in the Fort Denison moveable heritage collection. Items are located on Fort Denison or in a secure repository in an OEH office in Parramatta.



State Heritage Register - SHR 00985, Plan 2256
Fort Denison

Gazettal Date: 22 December 2000

0 80 160 240 320 Metres

Scale: 1:4,000
Datum/Projection: GCS GDA 1994

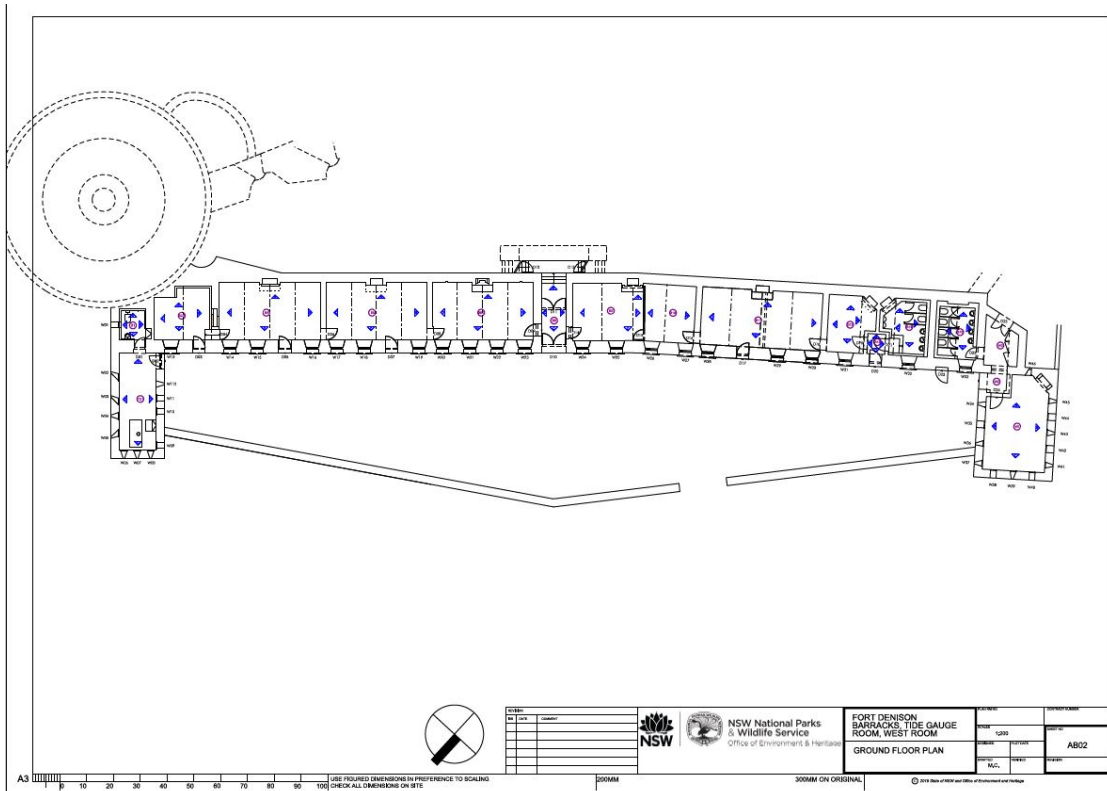
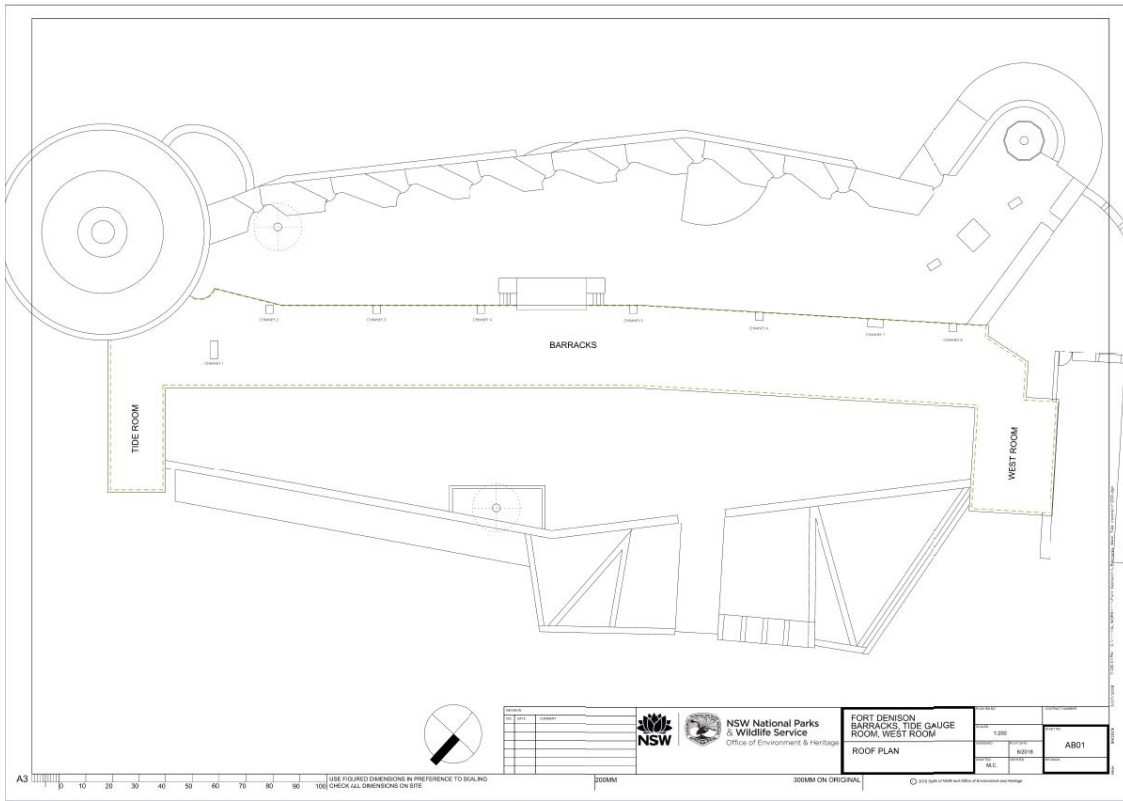


Legend

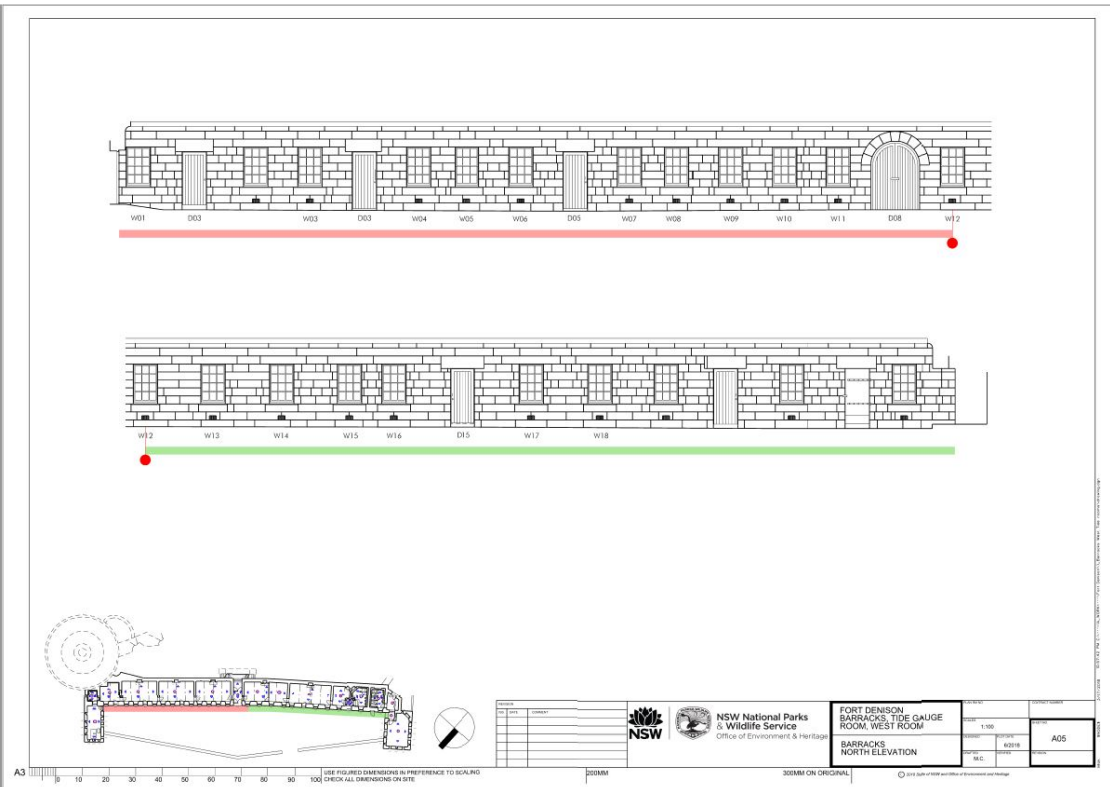
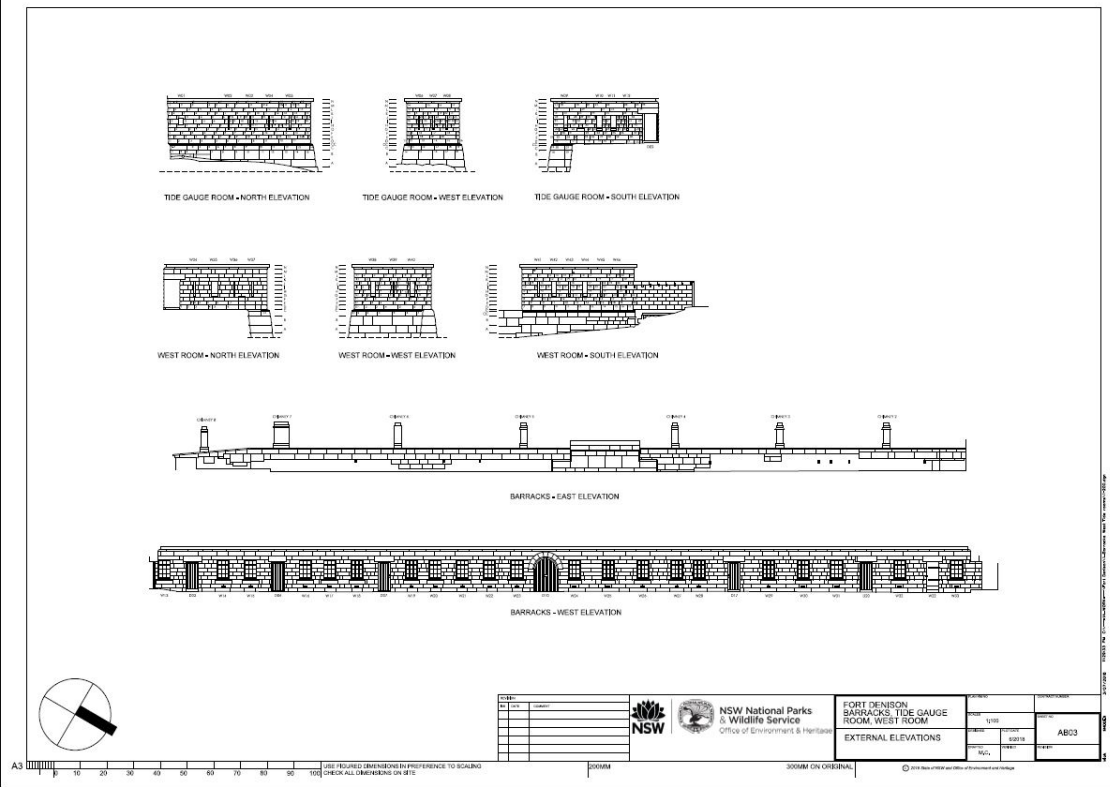
-  SHR Curtilage
-  Roads
-  Land Parcels
-  LGAs
-  Suburbs

Figure 96: State Heritage Register listing plan for Fort Denison (Source: OEH)

Appendix 2 Measured Drawings










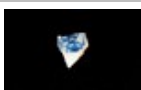
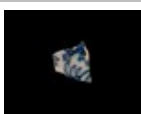


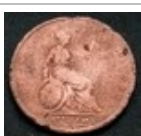


Fort Denison Conservation Management Plan
















Appendix 3 Fort Denison moveable heritage collection inventory


This 2018 inventory lists all the items in the Fort Denison moveable heritage collection. Items are located on Fort Denison or in a secure repository in an OEH office in Parramatta.

Object	Name/Title	Current location
	2008.1 Plate	Fort Denison
	2008.2 Whale Tooth	Fort Denison
	2008.3:1-2 Firing Pin Tin and Lid	Fort Denison
	2008.4 Portfire	Fort Denison
	2008.5 Button stick, brass	Fort Denison
	2008.6:1-4 Buttons - Uniform with cannon motif, rear Clark and Stephens	Fort Denison
	2008.7.1 Ceramic Fragment	Fort Denison
	2008.7.2 Ceramic Fragment	Fort Denison
	2008.8.1 Ceramic Fragment	Fort Denison
	2008.8.2 Ceramic Fragment	Fort Denison
	2008.8.3 Ceramic Fragment	Fort Denison
	2008.8.4 Ceramic Fragments	Fort Denison
	2008.10:1-2 Bowie knife and scabbard	Parramatta
	2008.11 Coin - King George IV and Britannia	Fort Denison

Fort Denison Conservation Management Plan

Object	Name/Title	Current location
	2008.14 Marble large clay 19th century	Fort Denison
	2008.15 Marble small clay 19th century	Fort Denison
	2008.16 Portfire (previous name Canon fuse)	Fort Denison
	2008.17 Family of Thomas Wren	Parramatta
	2008.18 Pillow sham edging - crocheted cream lace	Fort Denison
	2008.19 Bucket, leather	Fort Denison
	2008.20 Postcard Martello tower guns	Parramatta
	2008.21 Postcard Fort Denison - Sydney	Parramatta
	2008.22 Bucket, leather	Fort Denison
	2008.23 Spoon and Fork	Fort Denison
	2008.24:1-2 Harmonica reid plates	Fort Denison
	2008.25 Ornamental anchor	Fort Denison
	2008.26 Large Glass Bottle	Parramatta
	2008.27 Rope Cosh	Parramatta
	2008.30 Ladies Belt Buckle metal	Parramatta
	2008.31 Ladies Belt Buckle with floral motif	Parramatta
	2008.32 Belt Buckle	Fort Denison




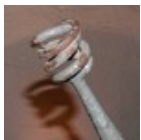






Fort Denison Conservation Management Plan

Object	Name/Title	Current location
	2008.33 Eight Hour Jubilee Badge 1855-1905	Parramatta
	2008.34 Thimble, 19th century	Parramatta
	2008.35:1-4 Buttons, tiny cream-coloured	Parramatta
	2008.36 Penny, Queen Victoria	Fort Denison
	2008.37 Navigation Aid Light Housing	Fort Denison
	2008.38 Navigation Light Housing No. 2	Fort Denison
	2008.39 Tub Cast-Iron 1858	Fort Denison
	2008.40 Tide Gauge	Fort Denison
	2008.41:1-2 Gun, 8 Inch Smooth Bore Shell Gun mounted on a replica Wood Garrison Sliding Carriage and Wood Traversing	Fort Denison
	2008.42 Gun, 12 Pounder Smooth Bore Howitzer on replica special Wood Garrison Standing Carriage	Fort Denison
	2008.43 Gun, 12 Pounder Smooth Bore Howitzer on replica special Wood Garrison Standing Carriage	Fort Denison
	2008.44 Gun, 12 Pounder Smooth Bore Howitzer on replica special Wood Garrison Standing Carriage	Fort Denison
	2008.45 Tide Gauge Funnel	Fort Denison
	2008.46 Life Buoy	Fort Denison
	2008.47 Oil Lamp - Argand type	Fort Denison













Fort Denison Conservation Management Plan

Object	Name/Title	Current location
	2008.48:1-11 Gunpowder cartridge canister	Fort Denison
	2008.48:2 Gunpowder cartridge canister	Fort Denison
	2008.48:3 Gunpowder cartridge canister	Fort Denison
	2008.48:4 Gunpowder cartridge canister	Fort Denison
	2008.48:5 Gunpowder cartridge canister	Fort Denison
	2008.48:6 Gunpowder cartridge canister	Fort Denison
	2008.48:7 Gunpowder cartridge canister	Fort Denison
	2008.48:8 Gunpowder cartridge canister	Fort Denison
	2008.48:9 Gunpowder cartridge canister	Fort Denison
	2008.48:10 Gunpowder cartridge canister	Fort Denison
	2008.48:11 Gunpowder cartridge canister	Fort Denison
	2008.49 Pulley single wheel sisal rope externally	Fort Denison Martello Tower
	2008.50 Pulley single wheel with wire rope externally	Fort Denison Martello Tower
	2008.51:1-3 Gun, 32 Pounder Smooth Bore on Wood Garrison Standing Carriage	Fort Denison Martello Tower
	2008.51:2 Wood Garrison Standing Carriage for 32 Pounder Gun	Fort Denison
	2008.52:1-2 Gun, 32 Pounder Smooth Bore on Wood Garrison Standing Carriage	Fort Denison Martello Tower














Fort Denison Conservation Management Plan

Object	Name/Title	Current location
	2008.52:2 Wood Garrison Standing Carriage for 32 Pounder Gun	Fort Denison
	2008.53:1-2 Gun, 32 Pounder Smooth Bore on Wood Garrison Standing Carriage	Fort Denison
	2008.53:2 Wood Garrison Standing Carriage for 32 Pounder Gun	Fort Denison
	2008.54 Bucket - leather	Fort Denison
	2008.56 Jug - copper	Fort Denison
	2008.56 Oil Lamp Filler Can	Fort Denison
	2008.57 Set of 5 Whale Oil Jugs	Fort Denison
	2008.59 Wad hook	Fort Denison
	2008.63.1 Lamp,oil - wall mounted	Fort Denison
	2008.63.2 Lamp, oil - wall mounted	Fort Denison
	2008.64 Measuring rule for water depth	Fort Denison
	2008.65 The Holy Bible Containing The Old and New Testaments	Parramatta
	2008.66 Photograph of Thomas Wren - first light keeper of Fort Denison	Parramatta
	2008.67 Diary, handwritten Tour Bookings 1961	Parramatta
	2008.68 Provisions Book July 1909 - Jan 1922	Parramatta
	2008.70 Plaque - MSB 1980s	Fort Denison
	2008.71 Birth certificate - Minnie Jane Wren Stobo	Parramatta







Fort Denison Conservation Management Plan

Object	Name/Title	Current location
	2008.72 Marriage certificate - Thomas Wren	Parramatta
	2008.73 Diary - handwritten - tour bookings - 1964	Parramatta
	2008.74 Souvenir Information Booklet "Fort Denison Sydney Harbour"	Parramatta
	2008.75 Signal Flag Cupboard	Fort Denison
	2008.75.02 Code Pennant	Fort Denison
	2008.75. 03 Signal Flag	Fort Denison
	2008.75.04 Signal Flag	Fort Denison
	2008.75.05 Numeral Pennant	Fort Denison
	2008.75.06 Signal Flag	Fort Denison
	2008.75.07 Signal Flag	Fort Denison
	2008.75.08 Signal Flag	Fort Denison
	2008.75.09 Numeral Pennant	Fort Denison
	2008.75.10 Signal Flag	Fort Denison
	2008.75.11 Signal Flag	Fort Denison
	2008.75.12 Signal Flag	Fort Denison
	2008.75.13 Signal Flag	Fort Denison

Fort Denison Conservation Management Plan

Object	Name/Title	Current location
	2008.75.14 Signal Flag	Fort Denison
	2008.75.15 Numeral Pennant	Fort Denison
	2008.75.16 Signal Flag	Fort Denison
	2008.75.18 Signal Flag	Fort Denison
	2008.75.19 Numeral Pennant	Fort Denison
	2008.75.20 Commemorative Flag	Fort Denison
	2008.75.21 Numeral Pennant	Fort Denison
	2008.75.22 Numeral Pennant	Fort Denison
	2008.75.23 Signal Flag	Fort Denison
	2008.75.24 Commemorative Flag	Fort Denison
	2008.75.25 Signal Flag	Fort Denison
	2008.75.26 Numeral Pennant	Fort Denison
	2008.75.27 Substitute Pennant	Fort Denison
	2008.77 Wall mounted lamp	Parramatta
	2008.78 Wall mounted triangular lamp No 2	Parramatta
	2008.79 Wall mounted triangular lamp No 4	Parramatta
	2008.80 Wall mounted triangular lamp	Parramatta














Fort Denison Conservation Management Plan

Object		Name/Title	Current location
	2013.1	Model of Fort Denison, carved	Parramatta
	2013.2.1	Photograph of 1881 Harbour Shot and Sydney defences. Copy from State Library NSW	Parramatta
	2013.2: 1-17	Framed collection of photographs depicting Fort Denison and its past Caretaker.	Parramatta
	2013.2.2	Photograph of 1881 Harbour Shot and Sydney defences. Copy from State Library NSW	Parramatta
	2013.2.3	Photograph of Fort Denison in 1887	Parramatta
	2013.2.4	Photograph of Sydney Harbour 1881 From the National Library.	Parramatta
	2013.2.5	Sketch of Pinchgut Island. Sandstone levelled in Sydney Harbour	Parramatta
	2013.2.6	photograph of Fort Denison titled "Navigation Lights"	Parramatta
	2013.2.7	Sketch of Fort Denison from Sydney shoreline.	Parramatta
	2013.2.8	Photograph of Fort Denison.	Parramatta
	2013.2.9	Photograph of Fort Denison.	Parramatta
	2013.2.10	Photograph of Fort Denison.	Parramatta
	2013.2.11	Photograph of the caretaker Mr William Charles Sumner on Fort Denison.	Parramatta
	2013.2.12	Photograph of the daughter (Clara) and son (William) of caretaker Mr William Charles Sumner On Fort	Parramatta
	2013.2.13	Photograph of the caretaker Mr William Charles Sumner with daughter and son on Fort Denison.	Parramatta
	2013.2.14	Photograph of the caretaker Mr William Charles Sumner and his dog Beauty	Parramatta







Fort Denison Conservation Management Plan

Object	Name/Title	Current location
	2013.2.15 Photograph of the caretaker Mr William Charles Sumner firing the 1pm cannon	Parramatta
	2013.2.16 Photograph of the caretaker Mr William Charles Sumner preparing the 1pm cannon for fire	Parramatta
	2013.2.17 Photograph of the caretaker Mr William Charles Sumner Firing the 1pm cannon	Parramatta
	2013.3 Gong - large circular brass	Fort Denison
	2013.4 Fog Bell	Fort Denison
	2013.20 Box	Fort Denison
	2014.1 Sydney Harbour Trust letter authorising visit to Fort Denison on 25/2/1936	Parramatta
	2014.2 Photograph of the painting of USS Chicago and plaque	Parramatta
	2014.3 Permit to visit cards from 1986/7	Parramatta
	2014.4 Bowie Knife with bone handle	Parramatta
	2014.5 Harriet Wren marriage certificate	Parramatta
	2014.6.1 Wren Family Register Document Parents Names and Genealogy	Parramatta
	2014.6.2 Wren Family Register Document Children's Names and birthdates	Parramatta
	2014.7.1 Wren Family Register Document Deaths	Parramatta
	2014.7.2 Wren Family Register Marriages	Parramatta
	2014.8 Meteorological Observing Book for the Year 1912	Parramatta
	2014.9 Meteorological Observing Book for the Year Jan 1st 1922-1923	Parramatta

Fort Denison Conservation Management Plan

Object	Name/Title	Current location
	2014.10 Souvenir Information Booklet "Fort Denison Sydney Harbour"	Parramatta
	2014.13 Pulley two wheels with wire rope externally	Fort Denison Martello Tower
	2014.14 Pulley two wheels with sisal rope externally	Fort Denison Martello Tower
	2014.15 Meteorological Observing Book for the Year Jan 1st, 1873 - Feb 1880	Parramatta
	2014.16 Book - provisions records Jan 1st, 1883 - May 1896	Parramatta
	2014.19 Diary, handwritten Tour Bookings 1965	Parramatta
	2014.20 Diary, handwritten Tour Bookings 1966	Parramatta
	2014.21 Booklet, souvenir "Fort Denison Sydney Harbour"	Parramatta
	2015.1:1-3 Large Quoin, Wood	Fort Denison Martello Tower
	2015.1:2 Large Quoin, Wood	Fort Denison Martello Tower
	2015.1:3 Large Quoin, Wood	Fort Denison Martello Tower
	2015.2:1-2 8 Inch Spherical Shell	Fort Denison Martello Tower
	2015.2:2 8 Inch Spherical Shell	Fort Denison Martello Tower
	2015.3:1-2 Small Quoin, Wood	Fort Denison
	2015.3:2 Small Quoin, Wood	Fort Denison

Fort Denison Conservation Management Plan

Object		Name/Title	Current location
	2015.4:1-5	Sponge	Fort Denison Martello Tower
	2015.4:2	Sponge	Fort Denison Martello Tower
	2015.4:3	Sponge	Fort Denison Martello Tower
	2015.4:4	Sponge	Fort Denison Martello Tower
	2015.4:5	Sponge	Fort Denison Martello Tower
	2015.5	Rammer	Fort Denison
	2015.5:1-6	Hand Spike	Fort Denison Martello Tower

Appendix 4 Sandstone Conservation Works 1983–1995

1. Tide room, eastern exterior wall: Approx. 80% of stone replaced with indents 150 and 300mm thick. Kent Street stone used to replace some of the earlier repairs. Some of stone repaired with indents on north side. North side is indented with stone referred to as Maroubra stone. South wall contains Arnold's Paddington stone, although the exact quarry needs to be confirmed.
2. Northern exterior barrack wall: window sills replaced and stone indents 100mm inserted in wall on various locations, mostly to replace 1957 restoration job. There are still many Maroubra stone indents remaining in this wall. The replacement stones at the base of the wall were provided with a horizontal damp proof course in the joint below. Usage of Kent Street stone is confined to the sills and lower ashlar courses.
3. West Room (Tea room) exterior: Stone indents 100mm inserted to north and north/west sides. Most of stone repairs to 1957 work either in Paddington or Maroubra stone. The repairs are thin gang sawn stone face cladding which suggests that the unsympathetic repairs unlikely to be undertaken by Paddington as the quarry owner was a monumental mason. (Need to confirm this through Mitchell Library records.)
4. West Room (Tea room) interior: Paint stripped from walls, 100mm indents used, window sills replaced in large blocks. Windows glazed to reduce weathering. Kent Street stone used internally, Wondabyne stone used externally again replacing yellowblock possibly from Bondi. Step loop holes to some windows lost.
5. West seawall: Seawall damaged by vessel, top course dismantled and rebuilt, two stones (second and third from north) replaced. Wondabyne stone used.
6. New wall – south backyard: New wall was built between slipway and BBQ area. Wondabyne stone used. This quarry is owned by Gosford Quarries but is a different deposit to their Somersby and Gosford quarries.
7. Segmental wall – south/west end. Original deteriorated stone was pushed over to form part of breakwater below. Kent St. Stone used in replacement.
8. Semicircular retaining wall (next to Martello tower as ficus bed) Wall dismantled to parapet level and rebuilt with approx. 12-14 new pieces.
9. Basement of Martello tower – exfoliated stairwall stone dressed back approx. 75mm, sparrow picked to match original surface. Stone indents 100mm deep to basement rooms walls. Indents repaired in Kent Street yellow block.
10. Interior of B. 11 stone indents repaired in Kent Street yellow block.
11. Martello tower – indents and repointing to lower areas works in 1994-95. Wondabyne indents replaced earlier Bondi yellow block indents with trail blocks of Capricorn 'Pink'. Whole of exterior of Martello tower was repointed.
12. Terrace seawall – new blocks in one course along the length of the seawall, 1995. Wondabyne indents replaced some earlier Bondi yellow block indents and replacement stones.
13. The exterior of the eastern end of barracks was repointed during 1993-94.

Notes supplied by Department of Public Works with additional comments by Anne Higham, January 1997.